Set the PACE St. Louis

PROGRAM MANUAL

Set the PACE St. Louis

ENERGY EFFICIENCY FINANCING FOR HOME OR BUSINESS

ST LOUIS
Historically & Dynamically
SUSTAINABLE

THE COMMON SEAL OF THE CITY OF ST. LOUIS.

June 18, 2012

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Executive Summary

Set the PACE (Property Assessed Clean Energy) St. Louis introduces a means for commercial and residential property owners to make energy efficiency and renewable energy property improvements with little to no up-front costs. The initial expenses typically associated with energy savings improvements have been a significant barrier for property owners to make these improvements—especially in the recent economic downturn.

Set the PACE St. Louis allows commercial and residential property owners to voluntarily pay for approved energy efficiency and renewable energy improvements by attaching the cost of these projects to their property tax bill. Each energy savings project is amortized up to a 20-year period, providing the property owner with a cash-flow neutral or cash-flow positive energy savings solution. In other words, approved projects will provide energy savings that equal or exceed the project's overall cost.

The repayment obligation of the PACE financing is attached to the property, not to the individual property owner. PACE financing stays with the property in the same manner as a special tax assessment for street or sewer improvements. If a property owner decides to sell before the property tax assessment is fully paid, the energy equity is transferred to the new property owner who then assumes the payments as special tax assessments just like the original borrower. Tying payment to the property solves credit and collateral issues for energy efficiency and renewable energy loans, reduces up-front installation costs, and allows for both the payment and the value of the installation to be transferred from one owner to the next. If the special tax assessment is not paid, the City Collector of Revenue can foreclose on the delinquent property in the same manner as for non-payment of property taxes.

There is a limitation on availability for PACE financing for mortgaged residential properties due to concerns raised by the Federal Housing Finance Agency (FHFA). Currently, residential property owners who own their home free-and-clear or homeowners with existing mortgages who either (a) agree to satisfy PACE assessment in full if they sell their home and/or (b) pursue PACE financing as a home equity loan (e.g., subordinate to existing mortgage) will be able to participate in the program.

State enabling Statute: Missouri House Bill 1692—
Signed into law by Gov. Jay Nixon on July 12, 2010.

The Missouri PACE Statute provides for one or more municipalities to form "Clean Energy Development Boards" to enter into "Assessment Contracts" with property owners, "under which the property owner agrees to pay an annual assessment for a period of up to twenty years in exchange for financing of an energy efficiency improvement or a renewable energy improvement." The Clean Energy Development Board (the "CEDB") may "contract for outside administrative services to provide financing origination." See **Exhibit G1**.

Set the PACE St. Louis has been designed so that initial financing of projects may be provided by local Missouri community banks. PACE is a private-sector solution leveraging private capital to help spur energy savings and economic recovery. Its revenue neutral characteristics make PACE a timely and innovative solution to help get our economy back on track. [Additional start-up funding sources may be available to the program through grants from the Missouri Department of Natural Resources, U.S. Dept. of Energy, and/or the American Recovery and Reinvestment Act.]

Program Size: Set the PACE St. Louis program is fully scalable. The initial commitment by community banks is anticipated to be $8,000,000, plus additional funding on a property-by-property basis to the extent that any property qualifies for a community development loan in accordance with the Community Reinvestment Act. The average residential project is projected to be $9000 per home. Commercial projects can vary greatly from $25,000 to millions of dollars in energy efficiency and renewable energy property improvements.

Bonding Projects: The Missouri PACE Statute states that, "Clean Energy Development Boards may issue bonds payable from special assessment revenues generated by assessment contracts." The practical threshold at which a bond may be issued for aggregated PACE projects is approximately $5 million. This translates to approximately 555 residential PACE projects averaging at $9000 per home aggregated in a single bond issuance. For commercial PACE projects, a much lower number may be aggregated to reach the $5 million bond issuance threshold due to the commercial assessment contracts, on average, being significantly higher than residential. Commercial and residential PACE assessment contracts may be combined into the same issuance as long as the grouped contracts meet underwriting standards. A Debt Service Reserve fund will be established to cover loan losses. Under Set the PACE St. Louis, the potential for bonding projects will begin after the initial funding capacity has been reached.

Administrating Agency: Per the Missouri PACE statute, "one or more municipalities may form Clean Energy Development Boards." Other municipalities (county, city, or incorporated town or village) may join the CEDB. A third-party administrative firm may be employed by the CEDB to manage the program and complete day-to-day activities. Participating Missouri municipalities will pass an enabling ordinance that will reflect the state enabling PACE statute. The City of St. Louis has formed a Clean Energy Development Board under the authority of Ordinance No. 69056. See **Exhibit G2**.

Public Benefit Consideration: A basic component of the PACE financing concept is the idea that embedded in any energy efficiency or renewable energy retrofit performed on private property is an intrinsic benefit to the public interest in terms of increasing energy independence, lowering stress on the energy grid, stimulating the local economy through energy savings, job creation, and reducing Missouri's carbon emission pollution. Set the PACE St. Louis is designed with rigorous consumer protections, quality assurance and best practices in energy efficiency and renewable energy contracting standards. This approach guarantees the most favorable energy savings and return-on-investment on a contract-to-contract basis, combining to provide the best public benefit.

Local Business Growth, Job Creation and Economic Development: It is estimated that retrofitting 5% of the City of St. Louis buildings and homes would create approximately 200 jobs and generate $40 million in economic activity, potentially saving residents and businesses millions in energy costs, and making a substantial contribution to the City's climate change measures and sustainability goals.

Background

A broad coalition of Missouri statewide groups helped to educate, spread awareness, and build support, ensuring the passage of Missouri's PACE enabling legislation on the last day of the legislative session, May 15, 2010. Several municipalities supported PACE and were joined by energy-efficiency and renewable energy professionals, community bankers, environmental advocates, leading law firms, individual realtors, and other sustainability and business interests. This coalition worked together with co-sponsoring and key legislators building the bi-partisan support necessary to make PACE a reality. H.B. 1692 contains the enabling PACE statute and was signed into law by Gov. Jay Nixon on July 12, 2010 making Missouri the 20th state to pass PACE. As of the date of this publication, there are 27 states that have passed PACE into law. See **Exhibit G1**.

Learning from the failed and some might suggest reckless lending practices in the subprime mortgage industry over the last decade, the PACE program contemplated for the City of St. Louis must incorporate rigorous standards and protections to prevent lending and/or contractor abuses that have been evidenced in other such pilot programs instituted around the country. As such, the working model chosen for Set the PACE St. Louis was designed to deliver specific industry best practices, consumer protections, data verification and performance metrics drawn from trade standards developed and supported by the Missouri Department of Natural Resources (MO-DNR), Missouri Association of Accredited Energy Professionals (MAAEP), Building Performance Institute (BPI), Residential Energy Services Network (RESNET), Efficiency First's Home Performance Resource Center case studies, and the U.S. Department of Energy (DOE) best practice guidelines for PACE financing programs.

The rigors of the herein-described underwriting process are considered necessary in order to dissuade abuse that could potentially damage the integrity and viability of this PACE program in St. Louis.

Why PACE?

The innovative clean energy funding mechanism, Property Assessed Clean Energy or "PACE", has been recently named one of Harvard Business Review's ten breakthrough ideas of 2010 and Scientific American's top 20 ideas that can 'change the world'. PACE is a new funding model that allows local governments to partner with property owners to achieve savings on energy costs through energy efficiency and renewable energy improvements.

PACE removes historical barriers to energy efficiency and renewable energy installations:

• Eliminates initial capital requirements, replaced with yearly payments that correspond to the lifespan of the installation.

• Will be accessible to residential and business property owners of all income levels.

• Will incorporate both energy efficiency and renewable upgrades to properties.

• Will be sustainable, scalable, and flexible; it will be self sufficient with little to no public financial support.

PACE is a sound business approach for bringing energy efficiency and renewable energy industries to Missouri:

• **Job Creation:** In the recent recession, Missouri's building and construction trades lost four times the amount of jobs as the rest of our economy. PACE could create thousands of local quality jobs.

• **Economic Activity:** A PACE program could generate more than $5 billion dollars of economic activity with only 35% residential market penetration over 10-15 years. Commercial property PACE projects will likely account for millions of dollars of economic activity in the first year alone.

• **Domestic Manufacturing:** 90% of materials used in energy efficiency retrofits are currently manufactured in the USA.

• **Economic Stimulus:** Increasing energy independence acts as a local stimulus by saving money on energy importation.

PACE energy savings are particularly beneficial for Missourians in the long term due to projected coal-generated energy costs rising faster than in other states:

• 82.4% of Missouri's power is coal-generated, while on average only 50% of power is generated by coal elsewhere in the United States.

• Nationally, coal accounts for 83% of US carbon emissions, contributing to climate change.

• US Residential Electricity prices have gone up 50% in last decade.

PACE helps address immediate and long term environmental concerns:

According to the White House PACE Policy Framework, if only 15% of residential property owners nationwide participated, their emissions reductions would contribute 4% of the savings needed for the U.S. to reach 1990 greenhouse gas emissions levels by 2020. PACE financing increases the accessibility and affordability of energy saving measures, consequently lowering residential energy bills and reducing the City's environmental footprint.

PACE programs streamline financing of energy efficiency and renewable energy investments in three key ways:

• Property tax special assessments provide a secure, well-established payback mechanism that will lead to lower borrowing costs. The security of the payback mechanism makes it possible for PACE financing to be offered with no money down.

• The economies of scale from making PACE financing available to a large group of borrowers can reduce overhead and transaction costs.

• Effective administration of Set the PACE St. Louis will create more consumer confidence in the economic value of energy efficiency and renewable energy investments.

PACE financing underwriting structure is different than a traditional bank loan:

Set the PACE St. Louis is structured to address risks that could arise, in that property tax special assessments under PACE increase homeowner debt payment and take priority over private liens in the event of foreclosure by:

• Making this an opt-in, voluntary program subject to strict underwriting.

• Encouraging repayment through an escrowed account (when available), as it reduces the risk of non-payment of property tax special assessments.

• Ensuring that the loan does not cause the homeowner to owe more on the property than the property is worth.

General Program Information

Program Size: Fully scalable. The initial source of funds is anticipated to be available from a community bank in an aggregate amount of up to $8,000,000, plus any community development loans. The goal is to expend the $8,000,000 within 3 years of program launch and finance future phases through bonds issued by the City's Clean Energy Development Board.

Administrating Agency: The Set the PACE St. Louis Clean Energy Development Board (CEDB) will provide the administrative framework and may contract with a program administrator.

Participants: St. Louis City commercial property owners and residential property owners who own their homes free-and-clear, or homeowners with existing mortgages who either (a) agree to satisfy PACE assessment in full if they sell their home and/or (b) pursue PACE financing as a home equity loan (e.g., subordinate to their existing mortgage), are eligible to participate in the City's program.

Number of Projects: Unlimited. For the proposed initial $8,000,000 funding phase, the total number of projects will vary greatly due to the wide range of individual project budgets.

Types of Potentially Eligible Projects: Energy efficiency, renewable energy, and water conservation property improvements. See also Eligible Projects, Page 24.

Size of Financing: Commercial: $25,000 minimum and up. Residential: $3000 minimum to $35,000 maximum.

Servicing Fees: 0.5% of loan paid upon closing (min. $300).

Interest Rate: To be determined upon review of credit.

Application Processing Fee: $25. This fee is non-refundable and payable upon application submission. Annual reviews will determine if the fee should be increased or decreased.

Penalty: There is no penalty for paying off the loan in advance. Prepayment can be made directly to the program administrator. Late payments are subject to a penalty and will be treated the same as other penalties.

Term: Up to 20 years. Term will depend on project type and size of loan.

Particular Terms For Commercial Properties:
Loans less than $15,000 may have up to a 10-year term; loans greater than $15,000 may have up to a 20-year term. All repayments are paid through property taxes. Property taxes are due by December 31st of each year. Applicant may choose to pay in installments (option will be on

property tax bill) or through their bank escrow payments. Coordinating an escrow repayment plan with the Mortgage Company is the responsibility of the Applicant.

Particular Terms For Residential Properties:
Loans less than $7,000 may have up to a 10-year term; loans between $7,000 and $10,000 may have up to a 15-year term; and loans greater than $10,000 may have up to a 20-year term.

Federal Investment Tax Credit (ITC):
30% for qualified energy efficiency upgrades and qualified renewable energy upgrades.[1]

Reservations and Disclaimers:

It is the Applicant's responsibility to determine if they qualify for the Federal ITC. If in doubt, Applicants should consult a tax advisor. The Clean Energy Development Board will not provide tax advice to residents.

Except as otherwise provided by the Set the PACE ST. Louis program, the Clean Energy Development Board is not responsible for costs associated with obtaining an initial energy audit. It is the Applicant's responsibility to apply for any additional incentives or rebates. There is no guarantee that an application received by the CEDB will be funded.

The Clean Energy Development Board reserves the right to decline an Applicant if any of the application or underwriting requirements are not met.

The Clean Energy Development Board provides no warranties; participating property owners must repay their special tax assessment even if an energy improvement system fails before the special tax assessment is repaid.

In the event that a participant property owner sells their property before the assessment is paid back in full, the assessment stays with the property and payments continue with the new property owner. Participating property owners may be required to pay off the assessment in the event of a sale, based on the requirement of the purchaser's mortgage institution. The Clean Energy Development Board makes no warranties as to the survivability of the assessment in the event of a sale.

Failure to repay a PACE project loan through the special property tax assessment could result in the default and foreclosure of the property.

[1] NOTE: Tax credits may expire. Also, other local, state, and utility incentives may be available.

Step-By-Step Process — Commercial Program

1. *Acquire and assess potential commercial energy efficiency project.* While there is a marketing framework established for the Program (*see* **Exhibit C1**), program participants will be primarily drawn from the customer base of energy consultants, contractors, and ESCOs (energy service companies), in addition to community outreach to property managers and owners. Initial applications that provide basic property and owner data will be followed by a preliminary credit review and analysis of energy efficiency needs. These preliminary reviews will take place within 48 hours and should determine basic eligibility and potential scope of each project. Please see the sample program application attached as **Exhibit C2**.

2. *Commercial energy audit contracted and engaged.* The property owner will contact a participating commercial energy auditor for an analysis of their property to generate a list of approved potential energy efficiency improvements through the methodologies outlined in **Exhibit C3**. Please see list of potential commercial energy auditors in **Exhibit C4**.[2] The property owner can then select the improvements that they wish to finance through the Program based on the results of the energy audit, which will be the basis for the scope of work. This process can take up to 60 days for a small commercial building or up to 180 days for a large building.

3. *Completion of the design phase.* Once the scope of work has been defined with the input of the energy auditor as well as the property owner, the design phase can begin. The property owner will engage the contractor to develop a detailed design for implementation of the improvements. See **Exhibit C5**. This can take up to 90 days for a smaller building and another 120 days for a large building. As with the energy audit, this cost can be rolled into the program financing. This process may occur simultaneously to the audit process.

4. *Loan application documents forwarded to financing institute.* With design and construction documents complete, along with the scope of work, the owner can submit a full loan application to the lending institution. Please see loan application attached as **Exhibit C6**. The full application will have final construction costs and projected energy savings attached. Any additional administrative fees will be rolled into the project financing. It may take 30 to 45 days for the loan to close once the full application has been submitted with the supporting documentation.

5. *Construction phase.* Once financing has been approved for the project by the lending institution, construction of the improvements will begin. For larger projects, progress payment(s) can be made. If so, there may be progress inspections, as well as inspections and verifications required for the actual construction, such as building permits.

[2] Final approved contractor list will be generated by program administrator during implementation phase.

6. *Project verification and quality control.* Once the project is completed, the property owner will verify with the lending institution and the program administrator that the work has been completed. All construction liens will be signed off on and funding completed. In addition, the program administrator will provide to the CEDB a detailed verification of a sampling of program projects as a quality control measure.

7. *Post improvement measurement and verification.* As part of the verification process, the property owner will be asked to sign a release to allow the program administrator access to their utility bills for the year prior to improvements through the completion of the improvements and the final payment of the loan. Please see consent to release utility data attached as **Exhibit C7**. This will allow the program administrator to gather data that will verify the efficacy of the improvements for the subject property and, ultimately, the entire program. If the subject property is not performing as projected, follow up with the property owner can be done to identify potential causes. If the deviation from projections is not caused by external variables, such as weather or usage, the improvements can be analyzed to verify that they were installed correctly and whether corrections may be warranted. If the subject property is performing as projected with the improvements, this information will be shared with the property owner. This data, along with the improvement specifications, will be aggregated by the program administrator to provide ongoing reports to relevant authorities to gauge the economic impact, the overall energy savings and estimated green house gas emissions reductions Set the PACE St. Louis generates for the community.

8. *Ongoing payments.* The property owner will continue to make payments per the terms of the loan agreement directly to the lending institution. Only in the event of default will the assessment be recorded. Please see assessment contract attached as **Exhibit C8**.

Below are 4 broad categories of commercial properties and some observations on their characteristics with regard to their potential as a market for PACE financed projects.

1. **Office/commercial:** Most commercial leases are "triple net," meaning the tenant pays utilities, property insurance, and taxes on the property. This arrangement can diminish the incentive to use PACE for energy efficiency improvements. However, PACE can be proposed to the owner as a way to upgrade their property without it showing on the owner's balance sheet, and PACE-funded property improvements can provide lease marketing opportunities for the owner> PACE can be proposed to the tenant as a way to improve cash flow.

2. **Industrial:** With owner-occupied industrial properties, there is potential for large scale savings. Such properties may present a wide range of technical issues and may require

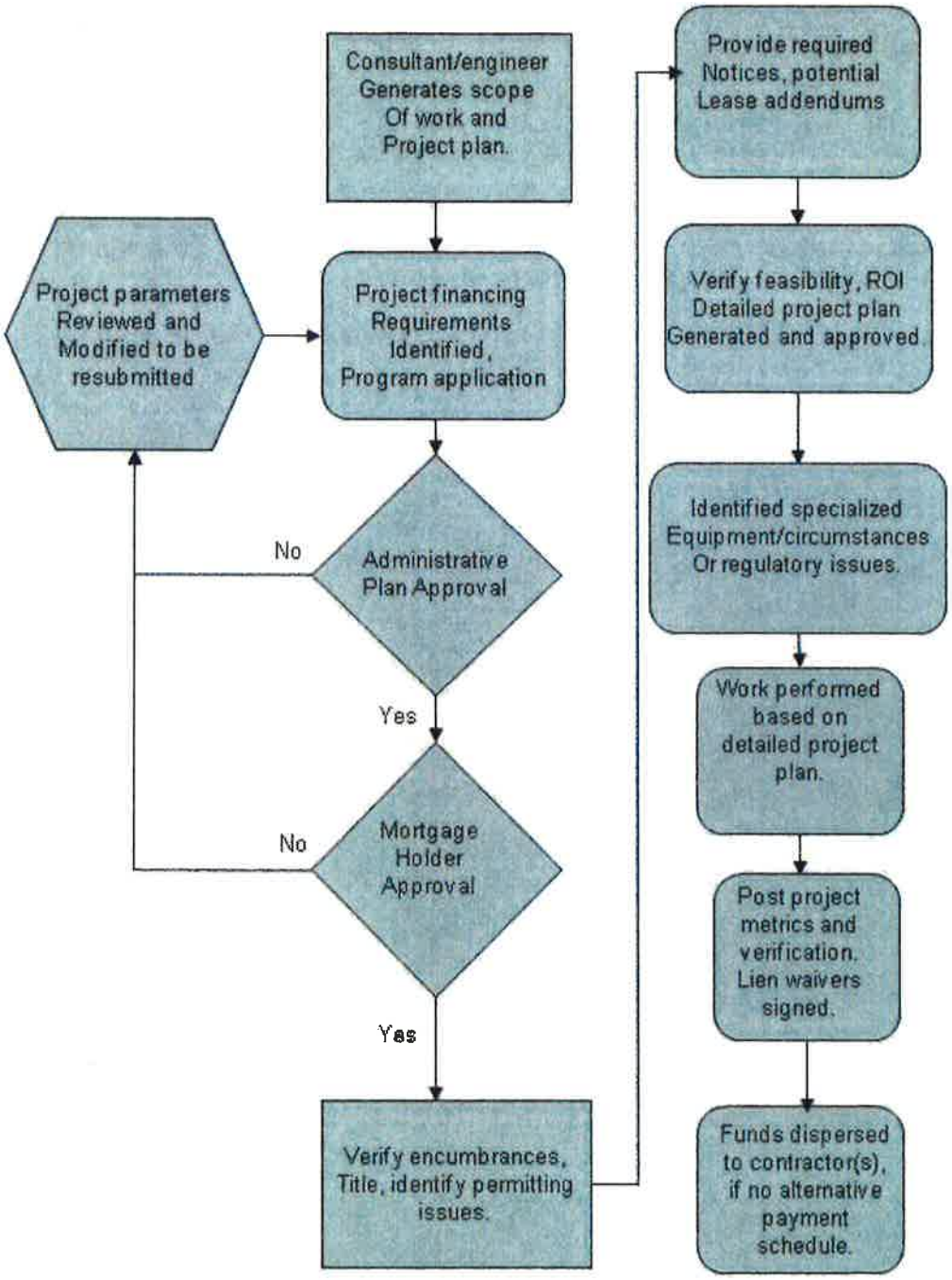
specialized contractors/consultants to address those issues. The PACE project could also provide marketing opportunities for the company.

3. **Multi-unit residential:** Split incentives are an issue here. Contractor skillset is standardized to a large extent. Lease turnover could help with passing assessments through to tenants, and it may be possible to implement the program through a lease amendment. Potentially large energy reduction opportunities could increase the property value and could go into increased rent. The PACE project could provide marketing opportunities for the owner. In addition, condominium developments would have similar incentives as those for single-unit residential or the condominium association could implement PACE. In such a case, PACE would function similar to a triple net lease in that the condominium association may be able to pass through costs and savings to the individual condominium owners, depending on how the association governing documents are drafted.

4. **Hotel/Motel:** The hotel/motel industry presents large market potential. Hotel projects would have a relatively standardized skill-set and large energy usage savings that the owner could realize, while at the same time increasing property value and not adding to the owner's balance sheet. The project could be a great public relations opportunity for a hotel or motel.

Other opportunities could lie with institutional buildings, but they could have access to more attractive financing options than PACE.

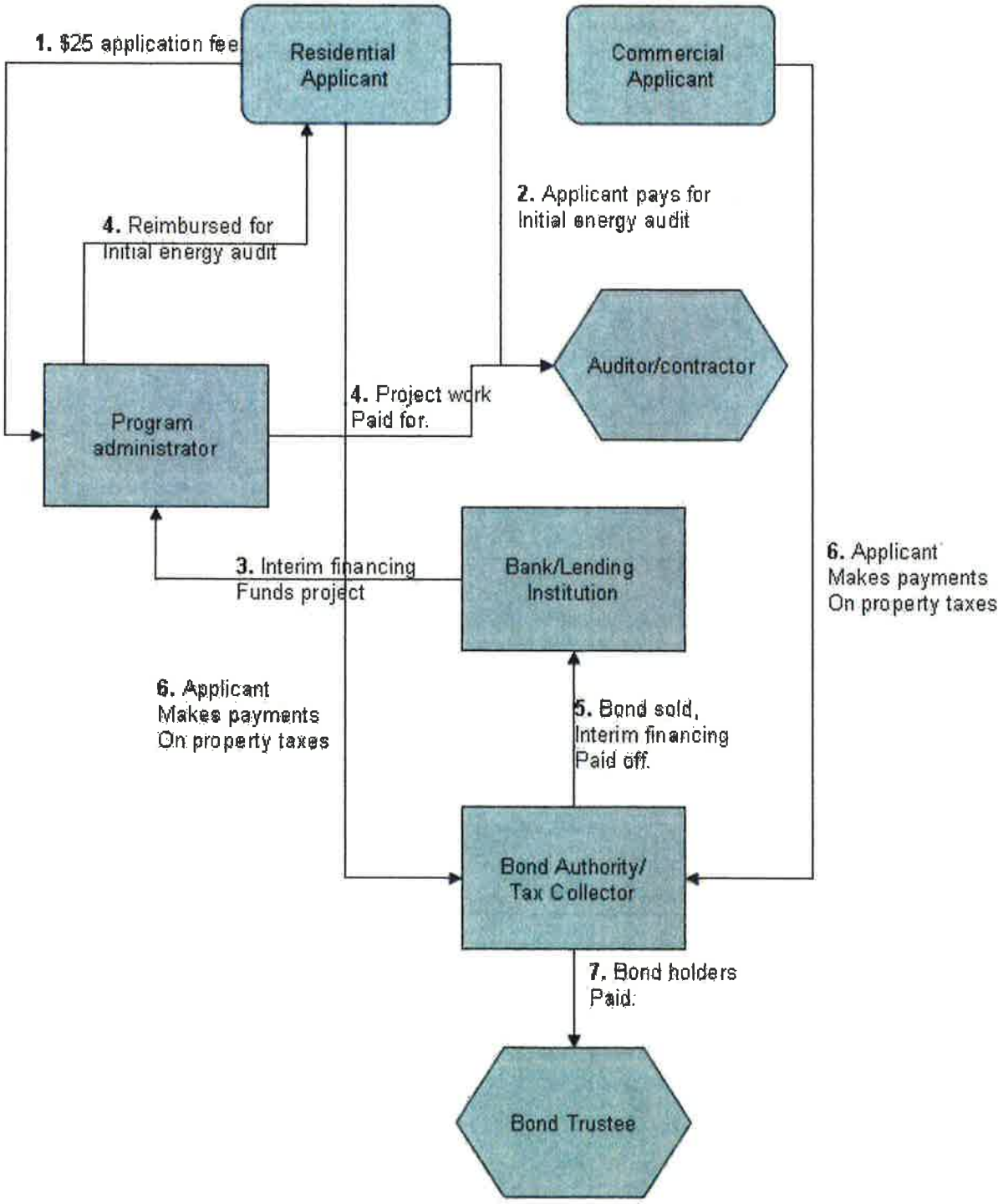
Set the PACE St. Louis
Commercial Program Loan Application Process Flow Chart



Sample Estimated Payment Schedule — Commercial Program

Commercial Project Cash Flow Analysis	
Project amount	$25,000.00
Term	20 years
Interest	7%
Monthly payment:	$194.00
Avg. Monthly Utilities	$1,800.00
Monthly savings (20%)	$360.00
Net positive monthly cash flow:	**$166.00**

Set the PACE St. Louis
Program Cash Flow Chart



Step-by-Step Process – Residential Program

1. *Market outreach into the community.* While there is a marketing plan for the program, because there is not a substantial marketing budget, alternative outreach efforts will be employed to grow the program. Please see marketing program attached as **Exhibit R1**. Program will be marketed through community outreach and strategic partnerships. Trade alliances between energy auditors, home performance contractors and Realtors, as well as financial partners and utilities would serve to direct applicants into the program.

2. *Prequalification and initial screening.* Property owners will fill out an online application to provide basic information on themselves and their property. Please see program application attached as **Exhibit R2**. Prequalification for program applicants will be based on self-reporting. The property owner's eligibility will be determined by a credit analysis and if the property meets the required underwriting criteria.

3. *Energy audit of the property.* The property owner will need to select a qualified energy auditor from a list of energy auditors that are participating in the program. Please see list of potential participating contractors, including energy auditors attached as **Exhibit R3**.[3] If the property owner has been referred to the program by an energy auditor, they can submit that auditor's information on the application and that auditor will be the default vendor for the energy audit. A certified energy audit is performed per the standards set forth in the Building Performance Institute's (BPI) technical specifications by the energy auditor and paid-for by Applicant.[4] Please see BPI's technical specifications document attached as **Exhibit R4**. The cost of the energy audit may be rolled into the overall financing for the project.

4. *Scope of work defined.* The energy auditor will recommend improvements to the property based on the audit results and a pre-defined "loading order" of improvements. Please see loading order of improvements attached as **Exhibit R5**. The loading order defines those improvements that will 1) offer the most increase in efficiency for the smallest capital investment (greatest energy savings) and 2) puts improvements in logical order. For example, improving a property's insulation and air sealing may reduce the required size of a replacement furnace —therefore, it becomes more financially prudent to properly insulate and seal a home before replacing the furnace. The property owner will select the improvements based on the recommendations of the energy auditor. If there are improvements that the property owner wishes to finance out of the

[3] Final approved contractor list will be generated by program administrator during implementation phase

[4] A certified energy audit is highly recommended to achieve the best energy savings, home safety and public benefit. A select group of improvements are eligible without performing an energy audit. If Applicant opts for no energy audit, proposed project must qualify under the Missouri PACE statute, namely, being verified by program administrator as having an economic benefit equal to or greater than the cost of the project, and per the US Dept. of Energy PACE guidelines, having an "expected Savings-to-Investment Ratio (SIR) greater than one," with the, "financed package of energy improvements (being) designed to pay for itself over the life of the assessment."

loading order, the application can reflect this along with an explanation to be considered for approval. Please see scope of work document attached as **Exhibit R6**. Loan application, scope of work and audit documents will be submitted to the program administrator, which will be forwarded to the lending institution for loan approval. Please see loan application attached as **Exhibit R7**.

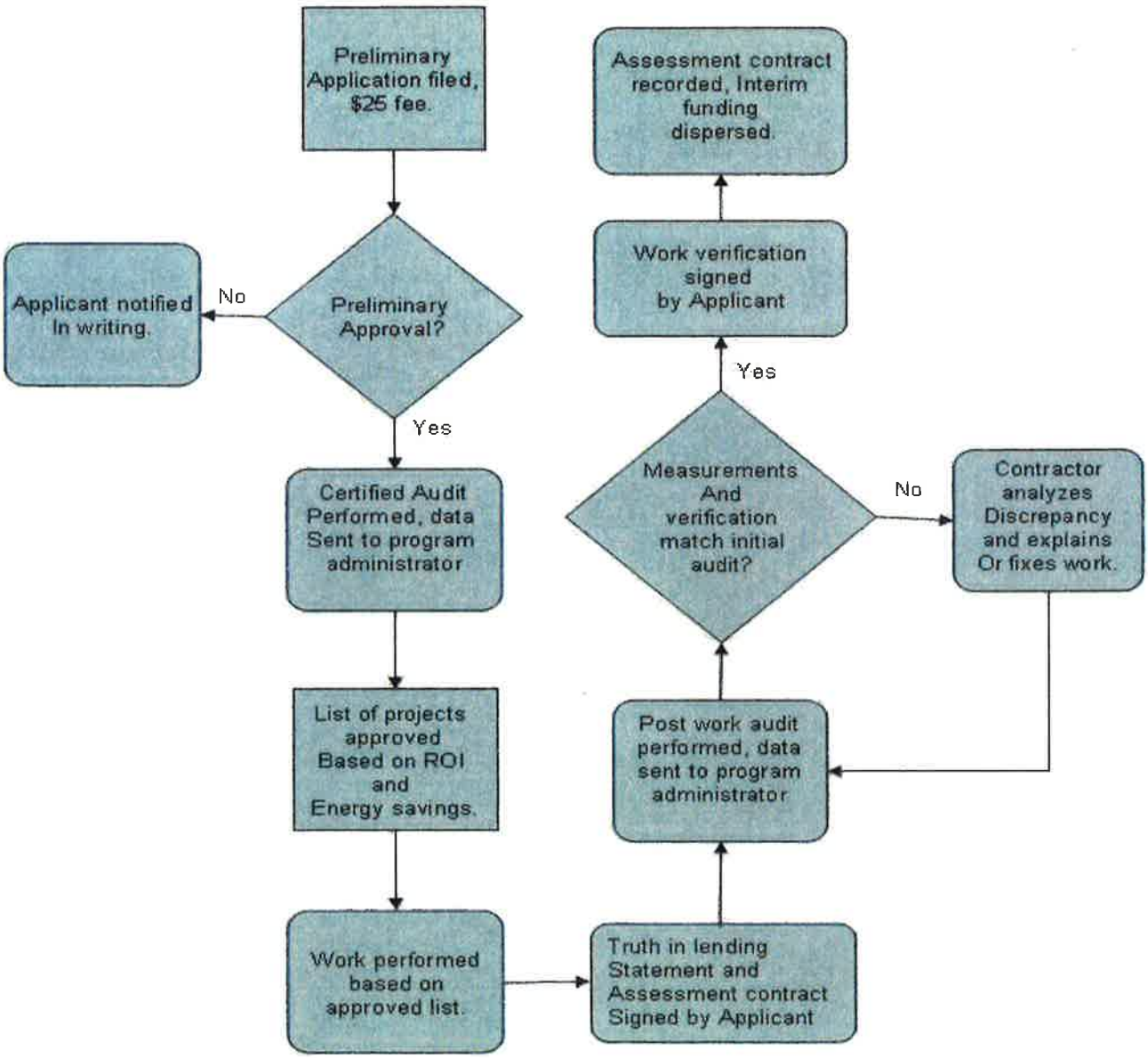
5. *Full loan approval.* Once the scope of work has been defined through input from the audit results and the property owner, the lending institution will run a full credit report and review the scope of work for loan approval. The lending institution will contact the property owner upon loan approval for loan closing. The property owner will then sign-off on the loan closing documents, including a truth-in-lending statement and assessment contract. Please see loan closing documents attached as Exhibit R7. The energy auditor and contractor will be notified of the loan and work approval to commence work on the improvements.

6. *Improvements implemented by contractor.* Work will be performed by the participating contractor previously selected by the homeowner during the scope of work phase. Once the work has been completed, the homeowner signs off on the work verification and assessment contract, which is then sent to the lending institution. The homeowner will also be asked to sign a consent form to release their property's utility data for the year preceding the improvements and the year following the improvements. Please see consent to release utility data attached as **Exhibit R8**. At this point the lending institution will disburse the funds to the contractor(s), who will forward any lien waivers to the lending institution. The property owner will receive a loan statement showing the total disbursement amounts.

7. *Payments commence on the loan.* The homeowner will begin to make payments on the loan directly to the lending institution. The assessment contract will only be recorded in the event of a default on the loan payments. Please see assessment contract attached as **Exhibit R9**.

8. *Data collated and quality control.* A sampling of projects will be reviewed for quality assurance, with the samplings focused on making sure that as many contractors/auditors are reviewed as possible. Please see the quality control methodology document attached as **Exhibit R10**. As projects are completed, the improvements and utility data will be collated to generate reports to track the program's proliferation and overall efficacy at increasing energy efficiency and carbon emission reduction. Please see the database description attached as **Exhibit R11**.

Set the PACE St. Louis
Residential Program Loan Application Process Flow Chart



[5] If the Applicant opts for no energy audit, proposed project must qualify under the Missouri PACE statute, namely, being verified (by the energy auditor in association with the contractor) as having an economic benefit equal to or greater than the cost of the project, and per the US Dept. of Energy PACE guidelines, having an "expected Savings-to-Investment Ratio (SIR) greater than one," with the "financed package of energy improvements (being) designed to pay for itself over the life of the assessment."

Sample Payment Schedule — Residential Program

Residential cash flow analysis - Energy efficiency upgrades only	
Project amount	$ 5,000.00
Term	15 years
Interest	7%
Monthly payment:	$ 45.00
Avg. Monthly Utilities	$ 220.00
Monthly savings (30%)	$ 66.00
Net positive monthly cash flow:	**$ 21.00**
Energy efficiency plus renewable (ground source heat)	
Project amount	$ 12,000.00
Term	20 years
Interest	7%
Monthly payment:	$ 93.00
Avg. monthly utilities	$ 300.00
Monthly savings (60%):	$ 180.00
Net positive monthly cash flow:	**$ 87.00**

Set the PACE St. Louis

Application Checklist

Date of application: _____

Name of Applicant: _____

Address of house applied for: _____

Name of Mortgage Company: _____

Name of holder of any other Mortgages: _____

House is owner-occupied?	Yes □	No □
Owner has no overdue property tax?	Yes □	No □
Owner has no overdue municipal tax?	Yes □	No □
Is owner current on mortgage?	Yes □	No □
Has house received an energy audit within the previous 2 years?	Yes □	No □
Is the house within the geographic jurisdiction of the City's Set the PACE St. Louis program (City of St. Louis)?	Yes □	No □

Eligible Projects

Eligible projects for Set the PACE St. Louis program include energy efficiency improvements, renewable energy installations and water conservation measures for commercial and residential properties.

The Missouri PACE enabling legislation lists the following qualified property improvements as eligible for coverage:

- Insulation in walls, roofs, attics, floors, foundations
- Insulation in heating and cooling distribution systems
- Storm windows and doors, multiglazed windows and doors, heat-absorbing or heat-reflective windows and doors, and other window and door improvements designed to reduce energy consumption
- Automatic energy control systems
- Heating, ventilating, or air conditioning distribution system modifications and replacements
- Caulking and weatherstripping
- Replacement or modification of lighting fixtures to increase energy efficiency
- Energy recovery systems
- Daylighting systems
- Photovoltaic systems
- Solar thermal systems
- Wind systems
- Biomass systems
- Geothermal systems
- White/green roofs

Note:
These improvements may be subject to prerequisites, and some may be given priority and/or phased in over time, at the direction of the City's CEDB.

The following tables list various possible energy efficiency improvements _____.

Energy Efficiency Improvements—Commercial and Residential

Measure Name	Requirement Spec
Doors, Glass	U 0.40 or less, SHGC 0.40 or less
Doors, Solid, Insulating	Energy Star
Geothermal Well Drilling	Custom
HVAC Air Conditioning - Split System Unit	14.5 SEER or 12 EER
HVAC Heat Pumps - Geothermal Exchange Closed Loop	≥ 15.5 EER
HVAC Heat Pumps - Geothermal Exchange Open Loop	≥ 17.8 EER
Insulation, Duct	Energy Star
Insulation, Reflective or Radiant Barriers	Energy Star
Insulation, Sub-floor	R19 minimum
Lighting, High Efficiency Fixtures	Energy Star
Pool Equipment, Pool Circulating Pumps	variable flow and/or multi-speed with controllers
Sealing, Duct	
Sealing, Whole House	Energy Star
Skylights	U value 0.60 or less, SHGC 0.30 or less
Vegetated Roofs	
Water Heater, Natural Gas Storage	≥ 0.67 EF and Energy Star
Water Heater, Tankless	≥ 0.82 EF and Energy Star
Weather-stripping	Energy Star
White or Reflective Roofs	
Window Filming	NFRC glazing ratings
Windows	Energy Star

Renewable Energy Improvements—Commercial and Residential

Measure Name	Requirement Spec
Electric Vehicle Plug-in Station	
Photovoltaic (PV) Systems	Rated by SRCC (Solar Rating and Certification Corp.)
Solar Thermal Systems for Hot Water	Rated by SRCC
Solar Thermal Systems for Pool Heating	Rated by SRCC

Water Conservation Improvements—Commercial and Residential

Measure Name	Requirement Spec
Aerators, Faucet	≤ 1.50 gpm
Core Plumbing System	Energy Star
Graywater System	Local Codes
Hot Water Heater, Instantaneous	Energy Star
Hot Water Recirculation System	Energy Star
Hot Water System, Demand Initiated	Energy Star
Insulation, Hot Water Pipes	R4
Irrigation Control System	ET Weather Based with Rain Sensor/Shut-off
Irrigation System	Matched Precipitation rate spray heads or drip
Rainwater Cistern	Permanently Installed
Showerhead	≤ 1.50 gpm
Toilets, High Efficiency	≤ 1.28 gpf
Water Softener, Demand Initiated	Energy Star
Whole House Water Manifold System	Energy Star

Energy Efficiency Improvements—Residential Only

Measure Name	Requirement Spec
Attic Fan	Energy Star
Cool Roof	Energy Star
Exterior Siding, Insulating	Energy Star
Home Energy Management Control System, Permanent	Custom
HVAC Air Conditioning - Package Unit	≥ 14 SEER/11 EER
HVAC Furnace, Natural Gas	≥ 90 AFUE
HVAC Heat Pump	
HVAC High Efficiency Air Filter / Air Cleaner	
Hydronic Radiant Heat	Must be in combination with efficient water heating
Insulation, Attic	R30 minimum
Insulation, Crawlspace	R19 minimum
Insulation, Wall	R13 minimum
Openings for Natural Light	≤ 0.40 U value
Whole House Fan System	Energy Star

Energy Efficiency Improvements—Commercial Only

Measure Name	Requirement Spec
Building Energy Management System	Custom
Coatings, Reflective Roof and Wall	Energy Star
Cool roof system	Energy Star
Customer Electric Vehicle Plug-in Station	Custom
High Efficiency Electric Hand Dryer	
HVAC Air Conditioning - Package Unit	13 SEER or 11 EER
HVAC Duct Zoning Control System	Custom
Lighting Control Systems with Occupancy Sensors	Custom
Motors and Controls	Custom

Water Conservation Improvements—Commercial Only

Measure Name	Requirement Spec
Aerators , Faucet	0.50 gpm
Cooling Condensate Reuse	Custom
Cooling Tower Conductivity Controllers	Custom
Deionization	Custom
Filter Upgrade	Custom
Foundation Drain Water	Custom
Industrial Process Water Use Reduction	Custom
Pre-rinse Spray Valves	1.2 gpm
Recycled Water Source	Custom
Urinals	1 pint
Urinals, Waterless	waterless

Approved Contractor Qualifications

Commercial

• Commercial Applicants can work with their preferred contractors if fully bonded, insured and licensed in the State of Missouri. Program administrator will approve each project's contracting team to ensure qualifications. Contractors will pay a fee to participate.

• Commercial PACE project energy contractors must be certified by ASHRAE. Commercial projects require a more comprehensive and technical energy consumption analysis than residential energy audits. The analysis requirements for commercial will be unique for each property and handled on a case-to-case basis.

• Commercial contractors must be fully bonded, insured and licensed professional contractors in the State of Missouri.

Residential

• Residential Applicants in this program must select approved Home Energy Auditors and Home Performance Contractors from Set the PACE St. Louis's certified list. Once selected for a job, Contractors will pay a per-job fee to participate.

• Home Energy Auditors under this program must meet the certification requirements set by the Missouri Department of Natural Resources.

Set the PACE St. Louis prefers the Missouri Department of Natural Resources qualifications for Auditor Certification, in which Home Energy Auditors have completed a training program leading to certification by either the Building Performance Institute (BPI) or the Residential Energy Services Network (RESNET).

• Approved Energy Auditors under this program must follow the on-the-job procedures of an accredited home energy audit (see below).

Recommended Residential Energy Audit Procedure and Content

Set the PACE St. Louis supports the following MAAEP definitions of what an accredited energy audit actually entails—as performed on the job site:

"MAAEP endorses the Building Performance Institute (BPI) standard for Home Energy Auditing and recommends that audits performed within the State of Missouri conform to the then current BPI Home Energy Auditing Standard with the additional requirement of a cost-benefit analysis

using computer software approved by BPI, the U.S. Department of Energy (DOE), or the Missouri Department of Natural Resources (note: if MDNR recommends a specific software suite, such recommendation shall become the adopted recommendation of MAAEP).

This standard's goal is to direct the energy auditor to develop a comprehensive list of measures which lead to whole-building, science-based energy improvements to existing low-rise residential buildings (single-family and multifamily). In this standard, these buildings are called "homes." An energy audit is an evaluation of a home's existing energy profile and the potential to improve the home's energy performance, and considers the policies and procedures of applicable residential energy programs.

The current BPI Home Energy Auditing Standard (BP-101) includes, but is not limited to the following:

Scope: The auditor will conduct a building-science-based evaluation of homes (residential low rise buildings) in terms of energy usage, durability, and occupant health/safety and provide a comprehensive written scope of work to improve the home (provided that such improvements are on the program list of eligible improvements).

This work scope shall be based on an evaluation of the whole house according to the requirements of this standard and the objectives of the customer. The work scope shall not be based primarily on a narrow product line, services of a contractor or convenience. The objective of the work scope is to optimize home performance cost-effectively, while maintaining or improving health and safety, and satisfying customer objectives.

The scope of work shall:

• Be based on building-science principles and include the use of appropriate equipment in diagnosing opportunities for improving energy efficiency, and minimizing health and safety hazards.

• Include a cost-benefit analysis of recommended improvements including consideration of applicable energy programs, incentives, regulations, energy costs, fuel process, and typical local energy-consumption levels. Cost-benefit analysis is to be based on computer analysis using software approved by BPI, the U.S. Department of Energy (DOE), or the Missouri Department of Natural Resources (note: if MDNR recommends a specific software suite, such recommendation shall become the adopted recommendation of MAAEP).

• Include a base load energy use analysis and advice to clients on energy use reduction strategies. When energy-consumption records are available, the audit shall include an analysis of energy consumption records (at least 12 months) to justify estimates of energy savings from the recommendations.

• Include a recommended work scope that recognizes best-practice installation procedures as well inclusion of a comprehensive set of specific energy efficiency and health/safety measures warranted by the site-specific circumstances.

• Include pre-work and post-work verification (for example, diagnostic testing).

• NOTE: Davis Bacon wages are not required because funding is not funded through the American Recovery and Reinvestment Act. This has been confirmed with the U.S. Department of Energy.

Required Underwriting Criteria

The following criteria must be met in order for a residential or commercial Applicant to qualify:

Commercial

- Applicant is a commercial property owner.
- Applicant has no outstanding and unsatisfied tax liens on the property.
- Applicant has no overdue property tax on the property.
- Property is current on all mortgage debt.
- Applicant has no overdue municipal service charges.
- Applicant or property is not currently involved in a bankruptcy proceeding.
- Commercial Applicants are required to have their mortgage lenders approve and sign-off on the project.
- Underwriting criteria for commercial projects will be handled on a case-by-case basis as the variables for project size and scope vary so greatly. The mortgage holder and bank providing interim financing, the program administrator, and the energy contractor will work hand in hand to design the most beneficial commercial PACE property improvement.

Residential

- Applicant is a property owner.
- Applicant has no outstanding and unsatisfied tax liens on the property.
- Applicant has no overdue property tax.
- Applicant has no notices of default or other evidence of property-based debt delinquency for the lesser of the past three years, or the property owner's period of ownership.
- Property is current on all mortgage debt.
- Applicant has no overdue municipal service charges.
- Applicant or Home is not currently involved in a bankruptcy proceeding.
- Applicant has clear and undisputed title to the home, agrees to pay off any outstanding debt secured by a mortgage or deed of trust on the home, or agrees to obtain a subordination of such debt from the debt holder. Applicants must prove that they are the legal owners of a property, unanimous approval of property-holders is required, and the title should be clear of easements or subordination agreements that conflict with the special tax assessment.
- The assessed value of the home is equal to or greater than 110% of the outstanding mortgage(s) plus PACE project costs. For example, if the Applicant has a remaining mortgage of $55,000, a home equity line of credit for $10,000 and a PACE application for $10,000, the assessed value of the home must be at least $93,500. Equation: Home value ≥ total property debt x 110%. Program administrator will access property tax bill to determine assessed value of property taxes and calculate the recommended special property tax amount.

Clarifying Questions

General inquiries regarding Set the PACE St. Louis can be directed to:

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Acknowledgements

Set the PACE St. Louis has been designed by a team lead by Catherine Werner (Sustainability Director for the City of St. Louis), the Future Energy Group at Armstrong Teasdale, Energy Equity Funding, Home Green Home, and Energy Solutions in collaboration with Missouri banks, the Missouri Association of Accredited Energy Professionals (MAAEP) and other statewide stakeholders. Valuable market research, information, language and statistics have been drawn from pilot PACE programs around the country, national PACE stakeholder groups and statewide ones, Missouri Department of Natural Resources (MO-DNR), U.S. Department of Energy, Lawrence Berkeley National Laboratory, Building Performance Institute (BPI), Residential Energy Services Network (RESNET), Missouri Votes Conservation, Renew Missouri and Efficiency First's Home Performance Resource Center.

Set the PACE St. Louis has been in development for over a year from hundreds of hours of research. Set the PACE St. Louis had brought together a comprehensive and integrated PACE team that supports local interests and local control. Our design team is a fully integrated set of industry partners in underwriters and financing, energy auditors, performance contractors, and marketing and legal. We've developed a scalable business model to cater to the unique needs and characteristics of the City of St. Louis and the broader Midwestern marketplace. Many challenges evidenced by other PACE pilot programs have been addressed through this model.

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Disclaimers

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Resources for More Information

Armstrong Teasdale LLP - Future Energy Group:
www.armstrongteasdale.com/PracticeAreas/FutureEnergyGroup/index.php

Missouri Department of Natural Resources (MO-DNR):
www.dnr.mo.gov

Energy Equity Funding LLC:
www.energyequityfunding.com

Missouri Association of Accredited Energy Professionals (MAAEP):
www.maaep.org

MO-DNR Division of Energy:
www.dnr.mo.gov/energy

MO-DNR Energize Missouri:
www.dnr.mo.gov/transform/energizemissouri.htm

Missouri Energy Initiative (MEI):
www.moenergy.org/

Missouri Votes Conservation (MVC):
www.movotesconservation.org

Renew Missouri:
www.renewmo.org

Missouri PACE legislation H.B. 1692:
www.house.mo.gov/content.aspx?info=/bills101/bills/hb1692.htm

White House Policy Framework for PACE programs:
www.whitehouse.gov/assets/documents/PACE_Principles.pdf

Vice President Biden's PACE Announcement:
www.pacenow.org/documents/VICE%20PRESIDENT%20BIDEN%20ANNOUNCEment.pdf

PACE Now: www.pacenow.org

Efficiency First: www.efficiencyfirst.org

Vote Solar: www.votesolar.org

Exhibit G1

Revised Statutes of Missouri Sections 67.2800-67.2835 (PACE Enabling Statute)

1. *Missouri Revised Statutes*

Chapter 67
Political Subdivisions, Miscellaneous Powers
Section *67.2800*

August 28, 2011

Citation of law--definitions--projects subject to municipal ordinances and regulations.

67.2800. 1. Sections 67.2800 to 67.2835 shall be known and may be cited as the "Property Assessment Clean Energy Act".

2. As used in sections 67.2800 to 67.2835, the following words and terms shall mean:

(1) "Assessment contract", a contract entered into between a clean energy development board and a property owner under which the property owner agrees to pay an annual assessment for a period of up to twenty years in exchange for financing of an energy efficiency improvement or a renewable energy improvement;

(2) "Authority", the state environmental improvement and energy resources authority established under section 260.010;

(3) "Bond", any bond, note, or similar instrument issued by or on behalf of a clean energy development board;

(4) "Clean energy conduit financing", the financing of energy efficiency improvements or renewable energy improvements for a single parcel of property or a unified development consisting of multiple adjoining parcels of property under section 67.2825;

(5) "Clean energy development board", a board formed by one or more municipalities under section 67.2810;

(6) "Energy efficiency improvement", any acquisition, installation, or modification on or of publicly or privately owned property designed to reduce the energy consumption of such property, including but not limited to:

(a) Insulation in walls, roofs, attics, floors, foundations, and heating and cooling distribution systems;

(b) Storm windows and doors, multiglazed windows and doors, heat-absorbing or heat-reflective windows and doors, and other window and door improvements designed to reduce energy consumption;

(c) Automatic energy control systems;

(d) Heating, ventilating, or air conditioning distribution system modifications and replacements;

(e) Caulking and weatherstripping;

(f) Replacement or modification of lighting fixtures to increase energy efficiency of the lighting system without increasing the overall illumination of the building unless the increase in illumination is necessary to conform to applicable state or local building codes;

(g) Energy recovery systems; and

(h) Daylighting systems;

(7) "Municipality", any county, city, or incorporated town or village of this state;

(8) "Project", any energy efficiency improvement or renewable energy improvement;

(9) "Property assessed clean energy local finance fund", a fund that may be established by the authority for the purpose of making loans to clean energy development boards to establish and maintain property assessed clean energy programs;

(10) "Property assessed clean energy program", a program established by a clean energy development board to finance energy efficiency improvements or renewable energy improvements under section 67.2820;

(11) "Renewable energy improvement", any acquisition and installation of a fixture, product, system, device, or combination thereof on publicly or privately owned property that produces energy from renewable resources, including, but not limited to photovoltaic systems, solar thermal systems, wind systems, biomass systems, or geothermal systems.

3. All projects undertaken under sections 67.2800 to 67.2835 are subject to the applicable municipality's ordinances and regulations, including but not limited to those ordinances and regulations concerning zoning, subdivision, building, fire safety, and historic or architectural review.

Rulemaking authority.

67.2805. 1. The authority may, as needed, promulgate administrative rules and regulations relating to the following:

(1) Guidelines and specifications for administering the property assessed clean energy local finance fund; and

(2) Any clarification to the definitions of energy efficiency improvement and renewable energy improvement as the authority may determine is necessary or advisable.

2. Any rule or portion of a rule, as that term is defined in section 536.010, that is created under the authority delegated in this section shall become effective only if it complies with and is subject to all of the provisions of chapter 536 and, if applicable, section 536.028. This section and chapter 536 are nonseverable and if any of the powers vested with the general assembly under chapter 536 to review, to delay the effective date, or to disapprove and annul a rule are

subsequently held unconstitutional, then the grant of rulemaking authority and any rule proposed or adopted after August 28, 2010, shall be invalid and void.

Clean energy development boards may be formed, members, powers of board--annual report--limitation on certain legal actions.

67.2810. 1. One or more municipalities may form clean energy development boards for the purpose of exercising the powers described in sections 67.2800 to 67.2835. Each clean energy development board shall consist of not less than three members, as set forth in the ordinance or order establishing the clean energy development board. Members shall serve terms as set forth in the ordinance or order establishing the clean energy development board and shall be appointed:

(1) If only one municipality is participating in the clean energy development board, by the chief elected officer of the municipality with the consent of the governing body of the municipality; or

(2) If more than one municipality is participating, in a manner agreed to by all participating municipalities.

2. A clean energy development board shall be a political subdivision of the state and shall have all powers necessary and convenient to carry out and effectuate the provisions of sections 67.2800 to 67.2835, including but not limited to the following:

(1) To adopt, amend, and repeal bylaws, which are not inconsistent with sections 67.2800 to 67.2835;

(2) To adopt an official seal;

(3) To sue and be sued;

(4) To make and enter into contracts and other instruments with public and private entities;

(5) To accept grants, guarantees, and donations of property, labor, services, and other things of value from any public or private source;

(6) To employ or contract for such managerial, legal, technical, clerical, accounting, or other assistance it deems advisable;

(7) To levy and collect special assessments under an assessment contract with a property owner and to record such special assessments as a lien on the property;

(8) To borrow money from any public or private source and issue bonds and provide security for the repayment of the same;

(9) To finance a project under an assessment contract;

(10) To collect reasonable fees and charges in connection with making and servicing assessment contracts and in connection with any technical, consultative, or project assistance services offered;

(11) To invest any funds not required for immediate disbursement in obligations of the state of Missouri or of the United States or any agency or instrumentality thereof, or in bank certificates

of deposit; provided, however, the limitations on investments provided in this subdivision shall not apply to proceeds acquired from the sale of bonds which are held by a corporate trustee; and

(12) To take whatever actions necessary to participate in and administer a clean energy conduit financing or a property assessed clean energy program.

3. No later than July first of each year, the clean energy development board shall file with each municipality that participated in the formation of the clean energy development board and with the director of the department of natural resources an annual report for the preceding calendar year that includes:

(1) A brief description of each project financed by the clean energy development board during the preceding calendar year, which shall include the physical address of the property, the name or names of the property owner, an itemized list of the costs of the project, and the name of any contractors used to complete the project;

(2) The amount of assessments due and the amount collected during the preceding calendar year;

(3) The amount of clean energy development board administrative costs incurred during the preceding calendar year;

(4) The estimated cumulative energy savings resulting from all energy efficiency improvements financed during the preceding calendar year; and

(5) The estimated cumulative energy produced by all renewable energy improvements financed during the preceding calendar year.

4. No lawsuit to set aside the formation of a clean energy development board or to otherwise question the proceedings related thereto shall be brought after the expiration of sixty days from the effective date of the ordinance or order creating the clean energy development board. No lawsuit to set aside the approval of a project, an assessment contract, or a special assessment levied by a clean energy development board, or to otherwise question the proceedings related thereto shall be brought after the expiration of sixty days from the date that the assessment contract is executed.

Assessment contract or levy of special assessment, requirements--maximum assessment--assessment to be a lien, when--right of first refusal, when.

67.2815. 1. A clean energy development board shall not enter into an assessment contract or levy or collect a special assessment for a project without making a finding that there are sufficient resources to complete the project and that the estimated economic benefit expected from the project during the financing period is equal to or greater than the cost of the project.

2. An assessment contract shall be executed by the clean energy development board and the benefitted property owner or property owners and shall provide:

(1) A description of the project, including the estimated cost of the project and details on how the project will either reduce energy consumption or create energy from renewable sources;

(2) A mechanism for:

(a) Verifying the final costs of the project upon its completion; and

(b) Ensuring that any amounts advanced or otherwise paid by the clean energy development board toward costs of the project will not exceed the final cost of the project;

(3) An acknowledgment by the property owner that the property owner has received or will receive a special benefit by financing a project through the clean energy development board that equals or exceeds the total assessments due under the assessment contract;

(4) An agreement by the property owner to pay annual special assessments for a period not to exceed twenty years, as specified in the assessment contract;

(5) A statement that the obligations set forth in the assessment contract, including the obligation to pay annual special assessments, are a covenant that shall run with the land and be obligations upon future owners of such property; and

(6) An acknowledgment that no subdivision of property subject to the assessment contract shall be valid unless the assessment contract or an amendment thereof divides the total annual special assessment due between the newly subdivided parcels pro rata to the special benefit realized by each subdivided parcel.

3. The total special assessments levied against a property under an assessment contract shall not exceed the sum of the cost of the project, including any required energy audits and inspections, or portion thereof financed through the participation in a property assessed clean energy program or clean energy conduit financing, including the costs of any audits or inspections required by the clean energy development board, plus such administration fees, interest, and other financing costs reasonably required by the clean energy development board.

4. The clean energy development board shall provide a copy of each signed assessment contract to the local county assessor and county collector and shall cause a copy of such assessment contract to be recorded in the real estate records of the county recorder of deeds.

5. Special assessments agreed to under an assessment contract shall be a lien on the property against which it is assessed on behalf of the applicable clean energy development board from the date that each annual assessment under the assessment contract becomes due. Such special assessments shall be collected by the county collector in the same manner and with the same priority as ad valorem real property taxes. Once collected, the county collector shall pay over such special assessment revenues to the clean energy development board in the same manner in which revenues from ad valorem real property taxes are paid to other taxing districts. Such special assessments shall be collected as provided in this subsection from all subsequent property owners, including the state and all political subdivisions thereof, for the term of the assessment contract.

6. Any clean energy development board that contracts for outside administrative services to provide financing origination for a project shall offer the right of first refusal to enter into such a contract to a federally insured depository institution with a physical presence in Missouri upon the same terms and conditions as would otherwise be approved by the clean energy development board. Such right of first refusal shall not be applicable to the origination of any transaction that involves the issuance of bonds by the clean energy development board.

Program authorized, requirements--application process--audit may be required.

67.2820. 1. Any clean energy development board may establish a property assessed clean energy program to finance energy efficiency improvements or renewable energy improvements. A property assessed clean energy program shall consist of a program whereby a property owner may apply to a clean energy development board to finance the costs of a project through annual special assessments levied under an assessment contract.

2. A clean energy development board may establish application requirements and criteria for project financing approval as it deems necessary to effectively administer such program and ration available funding among projects, including but not limited to requiring projects to meet certain energy efficiency standards.

3. Clean energy development boards shall ensure that any property owner approved by the board to participate in a property assessed clean energy program or clean energy conduit financing under sections 67.2800 to 67.2835 shall have good creditworthiness or shall otherwise be considered a low risk for failure to meet the obligations of the program or conduit financing.

4. A clean energy development board may require an initial energy audit conducted by a qualified home energy auditor as defined in subdivision (4) of subsection 1 of section 640.153 as a prerequisite to project financing through a property assessed clean energy program as well as inspections to verify project completion.

Alternative financing method.

67.2825. 1. In lieu of financing a project through a property assessed clean energy program, a clean energy development board may seek to finance any number of projects to be installed within a single parcel of property or within a unified development consisting of multiple adjoining parcels of property by participating in a clean energy conduit financing.

2. A clean energy conduit financing shall consist of the issuance of bonds under section 67.2830 payable from the special assessment revenues collected under an assessment contract with the property owner participating in the clean energy conduit financing and any other revenues pledged thereto.

Issuance of bonds.

67.2830. 1. A clean energy development board may issue bonds payable from special assessment revenues generated by assessment contracts and any other revenues pledged thereto. The bonds shall be authorized by resolution of the clean energy development board, shall bear such date or dates, and shall mature at such time or times as the resolution shall specify, provided that the term of any bonds issued for a clean energy conduit financing shall not exceed twenty years. The bonds shall be in such denomination, bear interest at such rate, be in such form, be issued in such manner, be payable in such place or places, and be subject to redemption as such resolution may provide. Notwithstanding any provision to the contrary under this section, issuance of the bonds shall conform to the requirements of subsection 1 of section 108.170.

2. Any bonds issued under this section shall not constitute an indebtedness of the state or any municipality. Neither the state nor any municipality shall be liable on such bonds, and the form of such bonds shall contain a statement to such effect.

Allocation of state's residual share of certain bond limitation.

67.2835. The director of the department of economic development is authorized to allocate the state's residual share, or any portion thereof, of the national qualified energy conservation bond limitation under Section 54D of the Internal Revenue Code of 1986, as amended, for any purposes described therein to the authority, any clean energy development board, the state, any political subdivision, instrumentality, or other body corporate and politic.

(L. 2010 H.B. 1692, et al.)

Exhibit G2

City of St. Louis Ordinance No. 69056 (establishing PACE Board)

BOARD BILL #195 CS INTRODUCED BY ALDERMAN JOSEPH RODDY, ALDERWOMAN JENNIFER FLORIDA, ALDERWOMAN CAROL HOWARD

An ordinance recommended by the Parks and Environment Committee establishing the Clean Energy Development Board of The City of St. Louis, Missouri (the "Clean Energy Development Board"); authorizing the Mayor to appoint the members of said Clean Energy Development Board; authorizing said Clean Energy Development Board to provide for property assessed clean energy financing for energy efficiency improvements to property within the City of St. Louis; authorizing and directing the taking of other actions as necessary or desirable to carry out and comply with the intent hereof; and superseding provisions of prior ordinances of the City to the extent inconsistent with the terms hereof.

WHEREAS, the General Assembly of the State of Missouri has adopted the Property Assessment Clean Energy Act, Sections 67.2800 to 67.2835, Revised Statutes of Missouri (the "PACE Act"), which authorizes the City of St. Louis and other municipalities and counties in the State of Missouri to create Clean Energy Development Boards to administer Property Assessed Clean Energy ("PACE") programs.

WHEREAS, PACE programs allow property owners to obtain loans through Clean Energy Development Boards to finance energy efficiency and renewable energy improvements to their property and repay such loans from the savings in energy costs resulting from such improvements.

WHEREAS, it is in the best interests of the health, safety, and welfare of the City and its residents to authorize the Mayor to appoint a Clean Energy Development Board to administer a PACE program within the City, and to fund such PACE program through the receipt of grant funds, the issuance of bonds, and/or other financing mechanisms and funding sources, and to

make or cause to be made loans to property owners within the City to fund energy efficiency improvements to their property, which loans would be repayable from the savings in energy costs.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY OF ST. LOUIS AS FOLLOWS:

Section 1. **Findings and Determinations**. The Board of Aldermen hereby finds and determines that it is in the best interests of the City and the health, safety, and welfare of its residents to authorize the Mayor to appoint a Clean Energy Development Board to administer a PACE program within the City and to fund such PACE program through the receipt of grant funds, the issuance of bonds, and/or other financing mechanisms and funding sources, and make or cause to be made loans to property owners within the City to fund energy efficiency and renewable energy improvements to their property, which loans would be repayable from the savings in energy costs.

Section 2. **Creation of a Clean Energy Development Board**. The creation of a Clean Energy Development Board, as set forth in the PACE Act, which shall hereinafter be known as the Clean Energy Development Board of The City of St. Louis, Missouri is hereby approved. The Clean Energy Development Board shall consist of five residents of the City of St. Louis appointed by the Mayor and approved by the Board of Aldermen. The Mayor is hereby authorized and directed to appoint said five members, with the advice and consent of said Board of Aldermen.

Section 3. **Authority of the Clean Energy Development Board.** The Clean Energy Development Board is hereby authorized to exercise all powers which may be exercised by such

boards pursuant to the PACE Act, as may be revised from time to time, and to adopt bylaws addressing the operations of the Clean Energy Development Board which are consistent with the PACE Act and this Ordinance.

Section 4. **Terms of Board Members.** Of the Clean Energy Development Board members first appointed by the Mayor and approved by the Board of Aldermen, one (1) shall be designated to serve on the Clean Energy Development Board for a term of two (2) years from the date of appointment, two (2) shall be designated to serve on the Clean Energy Development Board for terms of three (3) years from the date of appointment, and the remaining two (2) shall be designated to serve on the Clean Energy Development Board for a term of four (4) years from the date of appointment; thereafter, each vacancy resulting from the expiration of a term shall be filled in the same manner as set forth above, and each person so appointed shall be appointed to serve on the Clean Energy Development Board for a term of four (4) years, except that the initial term of a person appointed to fill a vacancy resulting from the resignation, death or incapacity of a Clean Energy Development Board member during an unexpired term shall consist of the unexpired portion of such term.

Section 5. **Actions in Accordance with the PACE Act.** It is hereby recognized that the requirements of the PACE Act as pertain to the authority, number, qualifications, terms and manner of appointment of persons to serve on the Clean Energy Development Board may, from time to time, be revised. The Mayor and such other persons as may be directed to act with respect thereto under the PACE Act in the future are hereby authorized to act in accordance with the PACE Act, as from time to time revised, so that at all times hereinafter the Clean Energy Development Board shall be and remain legally authorized to exercise the powers of a Clean

Energy Development Board under the PACE Act, without further action of the City, the Board of Aldermen, or the Clean Energy Development Board.

Section 6. **Further Authority**. The Mayor, the Comptroller, the Register, and other appropriate officials, agents, and employees of the City are hereby authorized to take such further actions and execute such documents as may be necessary or desirable to carry out and comply with the intent of this Ordinance, and to carry out, comply with and perform the duties of the City hereunder and under the PACE Act.

Section 7. **Severability and Superseding of Inconsistent Provisions**. The sections of this Ordinance shall be severable. In the event that any section of this Ordinance is found by a court of competent jurisdiction to be invalid, the remaining sections of this Ordinance are valid, unless the court finds the valid sections of the Ordinance are so essential and inseparably connected with and dependent upon the void section that it cannot be presumed that this Board would have enacted the valid sections without the void ones, or unless the court finds that the valid sections standing alone are incomplete and are incapable of being executed in accordance with the legislative intent. The provisions of this Ordinance hereby amend any provision of any ordinance of the City inconsistent with the terms hereof, but only to the extent of such inconsistency.

69056

David Sweeney
Clerk, Board of Aldermen

President, Board of Aldermen

Approved ☑
Disapproved ☐

Date December 22, 2011

Mayor

Truly Engrossed and Enrolled

Chairman

STATE OF MISSOURI }
CITY OF ST LOUIS } SS

I, the undersigned Register of said City do hereby certify the foregoing to be a true copy of Ordinance # 690[illegible] BB#.195 as approved: December [illegible] 2011 the original of which is on file in my office.

Witness my hand and the seal of the City of St. Louis this 1ST day of Mar. [illegible]

[illegible signature]

REGISTER

Exhibit C1/R1

Wireframe Marketing Plan/Webpage Format

Wire Frame - 90 Day Marketing Outreach Plan
City of St. Louis PACE Program

FUSE^3

Objectives of Marketing

- An energy-efficiency marketing campaign should span from initial consumer contact, to service request, to implementation of measures, to feedback and reward.

1. How will the campaign **inform** customers of the services and programs available?
2. How will the campaign **motivate** customers to sign up and follow through with recommended actions?
3. How can the marketing campaign generate a sense of **commitment** and buy-in?
4. How will the outreach strategy provide **feedback** to customers on their progress compared to peers and the progress of the program as a whole?
5. How will the outreach campaign **reward** customers for their actions/ investments?
6. How can the campaign be **iterative**, so that it reconnects with customers to provide second and third opportunities for service?
7. And how can the campaign leverage existing customers to **motivate** their peers?

Messaging is Critical

- Messaging should be customized for different groups of end users, since each customer group faces unique challenges in achieving energy efficiency.
- Focus Groups should be utilized before launching an outreach program to understand these issues and follow-up surveys conducted to assess the quality of the programs and services.
- Across the board, saving money is a much more attractive message than reducing Green House Gases or other environmental impacts, and specific steps or programs are more motivating than providing general information.
- **Specifically, it has been uncovered that:**

1. In the residential sector, competition or "keeping up with your neighbors" is effective.
2. In the commercial sector, testimonials from similar building owners are very motivating.
3. Larger customers require more direct and customized outreach strategies.

Strategies For Effective Marketing

Neighborhood Canvassing

- Make use of traditional community organizing tools, such as barn-raisings and social marketing through neighborhood networks.
- In the residential and small commercial sector, door-to-door canvassing is an incredibly effective recruitment and educational tool.
- Canvassing can be accomplished through a variety of groups including home performance contractors and other building tradesmen, local volunteers, and school or community groups.
- The canvassing should be one of the entry points into the pipeline for energy efficiency work.
- While canvassing in and of itself can raise awareness about energy efficiency issues, it is most effective **when there is an existing program into which to feed interested property owners**.
- **Canvassing too early in the program design phase can lead to disappointment and a loss of credibility in the program if there is not a next step to move for the property owner to take action or the process is confusing. ****[KEY HURDLE]**

Strategies For Effective Marketing

Social Media and Community Engagement

- One way to engage community members is to create a site that is "sticky"—that is, the website provides frequent updates of compelling and relevant content.
- This content can include:
  - Updates on ongoing community projects
  - Tips on do-it-yourself projects that can increase home efficiency
  - Posts explaining different incentive programs with examples of successful implementation
  - Links to interesting articles on renewable energy
  - Energy efficiency from around the web
  - A community calendar with links to upcoming events
  - Informational videos
  - Photos of the projects in process
  - Testimonials

Strategies For Effective Marketing

Social Media and Community Engagement CONTINUED

Blogs

- Blogs are an excellent way to communicate new legislative updates, describe emerging energy efficiency technologies, highlight community members who are achieving their energy savings goals, and talk about the environmental and financial impact of taking on certain energy efficient projects.

Social Networks

- The Greater Cincinnati Energy Alliance has an active Facebook page where they upload photos of recent canvassing activities, integrate their Twitter feed, post events, provide a forum for discussion, and provide a call to action that prompts users to sign up for their Twitter feed or to receive their email newsletter.
- A customizable Facebook widget can be added to a site's home page to provide a live stream of updates from members of the community.

Meetups

- Meetups are an effective way for to get out into the community and educate constituents on relevant programs.
- In order to publicize the event, local newspapers will be contacted to get coverage and include a link to the Meetup's site in the article.
- Meetup's software provides a forum for meet-up members to talk with one another and makes it easy to invite new members and communicate to the group once members have joined.

Strategies For Effective Marketing

Peer-to-Peer Comparisons and Incentive Structures

- Many software companies are building products that use group social behavior to incentivize users to commit to, and follow through with, actions that reduce energy consumption.
- For instance, Efficiency 2.0 has built out a product that focuses on the neighborhood level and enables users to befriend (via Facebook-style requests) those people in their immediate area who are participating in the program.
- Users can then compare their energy consumption with others in the group. Their sophisticated point system gives users social status based on energy and carbon reductions.
- Performance can then translated into rewards and rebated.
- Contests and Games are other ways that LEAs can reach out to the community. Efficiency 2.0 also has a suite of games that have been developed in order to increase retention and engagement.

Email Lists

- Develop lists to target various customer groups, such as businesses, residents, nonprofit groups, etc.
- These lists can be used to advertise workshops, events, utility incentives, local or national legislative alerts, and other marketing opportunities.

Strategies For Effective Marketing

Traditional Media

- Use media to market programs and services by generating newsworthy events such as the launch of an organization, special offerings to the community, major events like community canvasses, and other noteworthy activities.
- It is important to build credibility with local and regional news outlets by setting up editorial meetings and getting to know news reporting staff.
- Earned media in particular is a great low-cost way to generate interest.
- A local news story on the Greater Cincinnati Energy Alliance generated over 500 audit requests over one weekend.

Strategies For Effective Marketing

Partnering with Affinity Groups [BEST PRACTICES]

- In the case of the Cambridge Energy Alliance, CEA works with local environmental organizations, green business groups, and the municipality to cross promote its program at events, organize collaborative workshops and tying existing programs together.
- For instance, the city's Façade Improvement Program, which provides substantial grants for exterior upgrades, now includes CEA as a prerequisite to participate, having businesses get an energy assessment where feasible as part of the program.
- For its small commercial marketing activities, CEA has partnered with the Sustainable Business Leader Program to co-organize and advertise events that promote energy efficiency programs and sustainable business services.
- CEA's residential program targets both low-income and moderate to high income customers using various partners to access customers where they are such as through houses of worship, community centers, neighborhood groups, and other community service organizations.

Strategies For Effective Marketing

Partnering with Contractors [BEST PRACTICES]

- The City of Durham, NC has partnered with Advanced Energy, a local energy-efficiency training provider, to create a workforce dedicated to the city's residential energy efficiency retrofit goals.
- Advanced Energy and the City hope to adopt a "train the trainer" approach to train enough contractors to serve all of Durham's energy efficiency retrofit demand.
- Durham has partnered with other workforce development organizations such as BPI and community colleges, and also has a very narrow scope of training and retrofits targeted (duct sealing, air sealing, programmable thermostats, and insulation), to maintain tight quality control.

Wire Frame - 90 Day Marketing Outreach Plan
City of St. Louis PACE Program

**SUBJECT TO CHANGE AND ARE CONTINGENT UPON PACE PROGRESS/APPROVALS

Exhibit C2

Commercial Program Application

Set the PACE St. Louis

Preliminary Program Application

Commercial Property

This short questionnaire is designed for the Program Administrator and Lending Institution to best assess the property's eligibility for the Set the PACE St. Louis Program. Please answer as honestly and accurately as possible so that an accurate assessment can be made. This will help prevent wasting time, effort, and money on your part if there is something that may prevent your eligibility for the program.

Property Information:

Name of property owner/manager: _____

Property Address: _____

Zip code: _____ Total Square Footage of the property: _____

Number of stories: _____ Footprint of building (sq. footage of ground level):_____

Nature of commercial use of the property:

Office □ Warehouse □ Industrial/Manufacturing □ Multi-unit Residential □ Hotel/Motel
□ Other (please describe) _____.

Number of tenants: _____

Average monthly expenditure on gas: $_____

Average monthly expenditure on electric: $_____

What type of roof is on this property? □ Shingle □ Tile □ Flat □ Other (specify): _____

Is there a capital expenditure project being planned for the property that may qualify as an improvement under the Set the PACE St. Louis program: _____

_____

Are there any other unique issues or information that may be pertinent to participation in the Set the PACE St. Louis program? : _____

_____

_____

What projects do you anticipate financing through the Set the PACE St. Louis program?

_____

_____

_____

_____

Contractor referral:

If you were referred to the program by an energy auditor or contractor please indicate below:

Contractor company name: _____.

Property owner/manager acknowledgement and contact information:

Please supply the following contact information and place a check in front of your preferred method of contact:

Telephone: ☐ mobile_____ ☐ home _____ ☐ work _____

☐ Email: _____

By signing below you acknowledge that the Set the PACE St. Louis program will contact you within 2 – 4 business days with the results of your preliminary evaluation for eligibility as a participant in the program. Any action taken on your part prior to preliminary approval for participation in the Program may not be financed by the Program and ultimately, participation in the Program will depend on further information and credit verification.

Position: ☐ Property owner ☐ Property manager ☐ Other _____

Signed: _____

Print name: _____

Exhibit C3

Commercial Energy Audit Methodology Document

Set the PACE St. Louis

Outline for
Commercial, Institutional, and Industrial Properties

Program Summary

The Set The PACE St. Louis Commercial Energy Efficiency Program contemplates projects ranging from smaller, shorter duration and relatively inexpensive energy efficiency improvements (Category 1 in table below) to much larger, longer duration and considerably more capital intensive improvement projects (Category 4). The economics of the projects tend to improve as the projects increase in size and sophistication – given that (i) the larger projects tend to incorporate more systemic and substantive changes (realizing greater cost savings), (ii) the longer range projects would be expected to incorporate the simpler, shorter duration projects that would have paid for themselves in the first few years, and (iii) the larger projects may result in more affordable funding (lower points and/or interest rates). Please see the attached summary list of potential (though not exhaustive) efficiency measures that might be implemented as part of this PACE program.

This program is expected to be managed by the Program Administrator ("PA"). The PA's role in the process will be to:

- Market the program to the public
- Manage application flow
- Provide Audit Quality Control
- Provide Contractor Quality Control
- Provide Final Construction Loans
- Work with Third Party Disburser
- Respond to CEDB and/or SLDC
- Solicit Applications
- Prequalify Applicants
- Provide Loan Commitments
- Provide final project approval
- Provide final project close out
- Provide on-going Measurement & Verification

Note that it is expected that many of the functions or roles subscribed to the PA herein will be delegated by the PA to other project participants, such as, for example, the project lender. Thus, all references herein to the PA should be understood to include the PA's delegate.

The PA is expected to be comprised of a team that includes the Set The PACE St. Louis principal lender and technical, administrative, and marketing team members as appropriate to the needed tasks.

On the following pages are:

1. Description of the project flow.
2. Sample financial case studies showing probable economic parameters and performance.
3. A listing of customary energy efficiency measures and how they relate to probable energy savings and related payback periods.

Project Flow

The following is a discussion of program elements needed based on a probable sequence of events once an owner decides to seek a loan for energy efficiency improvements

1. Eligibility:

    a. Properties located within the City.
    b. Properties with sufficiently demonstrated energy inefficiency for which cost savings from improvements in efficiency can independently support the cost of project funding.

2. Prequalification: The owner submits a prequalification letter of intent that suggests measures that would be factored into a preliminary project feasibility calculation – prior to getting a qualifying audit. The prequalification letter shall include (i) building address, (ii) tax records locator number; and (iii) a release to allow the PACE Program Administrator (PA) to secure utility data from local gas, electric, water and sewer service providers.

    a. The following parameters will be analyzed by the PA to determine if the project is likely to qualify:
        i. Building Square Footage ("SF") / Type of Use / Hours of Operation
        ii. Gas and Electric Usage
        iii. Baseline Data for future Measurement and Verification (M&V) are established from utility usage regressions to weather.
        iv. "Pre" building performance is benchmarked through EPA Energy Star program
        v. Probable project size and cost effectiveness.

    b. Upon review by PA, a decision will be rendered relative to initial eligibility and prequalification requirements. For those projects deemed eligible and qualified, a notice will be issued requesting a more detailed application from the applicant – including both financial and technical information.

3. Application Process: For Projects deemed eligible to proceed in the process, the PA will issue an application to the owner that articulates the basic terms of the agreement:

    a. An energy audit of the building is required.
        i. For commercial buildings under 5,000 SF, audits may be provided by qualified residential auditors.
        ii. For commercial buildings between 5,000 and 10,000 SF, audits may be provided by a qualified residential auditor, with a review from an audit professional that is qualified for the commercial program.
        iii. For commercial buildings 10,000 SF and over, an investment grade audit is required from a qualified professional acceptable to the PA (and to the lending institution). This audit will follow the guidelines for an ASHRAE Level II energy audit (description attached as an appendix).
    b. The audit will be quality controlled (QC) to meet key early test parameters.

c. The subsidized cost of the audit and the QC effort are borne by the owner until such time as the minimum recommendations of the audit are implemented. These costs are reimbursable through the PACE loan.
d. There will be annual Measurement and Verification (M&V) requirements for the life of the loan. These M&V costs are also eligible for inclusion in the loan package.
e. Other terms, conditions and limitations yet to be determined in the process of developing application, contract and financial instrumentation specific to the PACE program.
f. Owner acknowledgement of these terms, etc. will be required in order to proceed in this PACE application process, along with the audit, referenced above.

4. Audit Processing & Project Approval: Based on the PA's assessment of the audit findings, the PA prepares a contract that stipulates the minimum measures to be implemented to qualify for the final loan package and the maximum that is available within the economic constraints of the program. This results in a conditional loan commitment from the PA's underwriter. The program offer is sent to the owner for signature. Once it is signed the owner is now authorized to implement the project.

5. Project Design: Owner goes through design and bids process:

    a. Project is designed
    b. Bids are obtained by general contractor on the work to be done
    c. General contractor selects contractor(s)
    d. Bids or contractor pricing form basis of loan commitment
    e. Final Loan Application based on final bids
    f. Loan is approved by the PA's underwriter and executed by all parties.

6. Implementation Effort:

    a. Owner enters into contract with contractor(s)
    b. Contractor(s) takes out necessary permits
    c. Periodic draws approved by design professional and owner
    d. Title company disbursement of funds for PA
    e. Lien Waivers are secured at each payment
    f. Contractor submits Substantial Completion documents
    g. Designer provides final punch list
    h. City inspectors sign off on work for City code compliance
    i. Project is fully Commissioned

7. Final Project Inspection: Verification of installation and final inspection and payment by PA.

8. Annual Measurement & Verification: PA performs on-going M&V

    a. If results do track projections, notification sent to owner
    b. If results do not track projections, notification sent to owner with follow up meeting to determine cause(s) of apparent failure to yield projected results. If the cause is equipment failure or improper equipment operation or scheduling, possible remedies are

developed. If the owner has changed operating procedures or expanded utilization, new calculations are developed to project the new actual savings.

c. "Post" performance measured through EPA Energy Star program.
Certificates applied for if project now qualifies as an "Energy Star Building".

Note that the above items and contracts with property owners will require disclaimers that the PA does not warrant or represent that the projected savings will occur.

Sample Financial Case Studies:

From the outset, it needs to be understood that the financial qualifications for this program will, in large part, tend to limit this to larger projects. Three cash flow illustrations are set forth below. The first illustrations shows a "low hanging fruit" scenario with a simple payback of 3 years and a projected energy savings of 15%; the second is a moderate effort with a simple payback of 5 years and a 20% projected savings; and the third shows a deeper investment with a simple payback of 8 years and 30% projected savings.

These illustrations clearly show three things: (1) given the assumptions made, smaller buildings may have marginal to no annual net savings; (2) larger buildings reach enough scale to make it really worthwhile for the bank to lend money without adding significant fees (which is an option); and (3) it doesn't make much sense for this program to be used to just go after low hanging fruit. It will clearly work better the deeper an owner takes the program into energy efficiency. Taking a $200,000 investment (a reasonable sized home loan) as a threshold, only one of the low hanging fruit options meets a $200,000 investment target; three of the medium range investment options meet that investment target; while six of the higher range investment options meet the $200,000 investment target. The thresholds and parameters to be used need to be reasonable and should be developed by the team as this program moves forward.

St. Louis City *Set the PACE* Program Prequalification Analysis

Building Energy Costs $ 1.75 /SF — Points/Fees 0.5%
Audit Cost $ 0.18 /SF — M & V Costs $200 per year
Reduction 15% Savings — 5 Term (yrs) — Simple Payback 3 years

SF	Annual Utility Cost	Audit Cost	Implement Cost	Annual Pmt	P&I Pmts (Total)	Interest 7.5%	Annual Savings	Annual Net Cash
5,000	$ 8,750	$1,350	$5,946	$1,470	$7,349	$1,402	$ 1,313	($157)
10,000	$ 17,500	$2,520	$10,497	$2,595	$12,973	$2,475	$ 2,625	$30
15,000	$ 26,250	$3,510	$14,652	$3,622	$18,108	$3,455	$ 3,938	$316
20,000	$ 35,000	$4,320	$18,412	$4,551	$22,754	$4,342	$ 5,250	$699
25,000	$ 43,750	$4,950	$21,775	$5,382	$26,910	$5,135	$ 6,563	$1,180
30,000	$ 52,500	$5,400	$24,743	$6,116	$30,578	$5,835	$ 7,875	$1,759
40,000	$ 70,000	$7,200	$32,658	$8,072	$40,359	$7,701	$ 10,500	$2,428
50,000	$ 87,500	$9,000	$40,572	$10,028	$50,140	$9,568	$ 13,125	$3,097
75,000	$ 131,250	$13,500	$60,358	$14,918	$74,592	$14,234	$ 19,688	$4,769
100,000	$ 175,000	$18,000	$80,144	$19,809	$99,044	$18,900	$ 26,250	$6,441
150,000	$ 262,500	$27,000	$119,716	$29,589	$147,947	$28,232	$ 39,375	$9,786
200,000	$ 350,000	$36,000	$159,288	$39,370	$196,851	$37,564	$ 52,500	$13,130
250,000	$ 437,500	$45,000	$198,859	$49,151	$245,755	$46,896	$ 65,625	$16,474

St. Louis City *Set the PACE* Program Prequalification Analysis

Building Energy Costs $ 1.75 /SF — Points/Fees 0.5%
Audit Cost $ 0.18 /SF — M & V Costs $200 per year
Reduction 20% Savings — 10 Term (Yrs) — Simple Payback 5 years

SF	Annual Utility Cost	Audit Cost	Implement Cost	Annual Pmt	P&I Pmts (Total)	Interest 7.5%	Annual Savings	Annual Net Cash
5,000	$ 8,750	$1,350	$12,992	$1,893	$18,928	$5,936	$ 1,750	($143)
10,000	$ 17,500	$2,520	$23,105	$3,366	$33,661	$10,556	$ 3,500	$134
15,000	$ 26,250	$3,510	$32,338	$4,711	$47,113	$14,774	$ 5,250	$539
20,000	$ 35,000	$4,320	$40,693	$5,928	$59,283	$18,591	$ 7,000	$1,072
25,000	$ 43,750	$4,950	$48,167	$7,017	$70,173	$22,006	$ 8,750	$1,733
30,000	$ 52,500	$5,400	$54,763	$7,978	$79,781	$25,019	$ 10,500	$2,522
40,000	$ 70,000	$7,200	$72,350	$10,540	$105,404	$33,054	$ 14,000	$3,460
50,000	$ 87,500	$9,000	$89,938	$13,103	$131,026	$41,089	$ 17,500	$4,397
75,000	$ 131,250	$13,500	$133,906	$19,508	$195,083	$61,176	$ 26,250	$6,742
100,000	$ 175,000	$18,000	$177,875	$25,914	$259,139	$81,264	$ 35,000	$9,086
150,000	$ 262,500	$27,000	$265,813	$38,725	$387,251	$121,439	$ 52,500	$13,775
200,000	$ 350,000	$36,000	$353,750	$51,536	$515,364	$161,614	$ 70,000	$18,464
250,000	$ 437,500	$45,000	$441,688	$64,348	$643,477	$201,789	$ 87,500	$23,152

St. Louis City *Set the PACE* Program Prequalification Analysis

Building Energy Costs $ 1.75 /SF — Points/Fees 0.5%
Audit Cost $ 0.18 /SF — M & V Costs $200 per year
Reduction 30% Savings — 17 Term (Yrs) — Simple Payback 8 years

SF	Annual Utility Cost	Audit Cost	Implement Cost	Annual Pmt	P&I Pmts (Total)	Interest 7.5%	Annual Savings	Annual Net Cash
5,000	$ 8,750	$1,350	$29,781	$3,157	$53,666	$23,885	$ 2,625	($532)
10,000	$ 17,500	$2,520	$54,052	$5,730	$97,402	$43,350	$ 5,250	($480)
15,000	$ 26,250	$3,510	$76,212	$8,079	$137,335	$61,122	$ 7,875	($204)
20,000	$ 35,000	$4,320	$96,262	$10,204	$173,464	$77,202	$ 10,500	$296
25,000	$ 43,750	$4,950	$114,201	$12,105	$205,791	$91,589	$ 13,125	$1,020
30,000	$ 52,500	$5,400	$130,030	$13,783	$234,314	$104,284	$ 15,750	$1,967
40,000	$ 70,000	$7,200	$172,240	$18,257	$310,377	$138,137	$ 21,000	$2,743
50,000	$ 87,500	$9,000	$214,450	$22,732	$386,439	$171,989	$ 26,250	$3,518
75,000	$ 131,250	$13,500	$319,975	$33,917	$576,595	$256,620	$ 39,375	$5,458
100,000	$ 175,000	$18,000	$425,500	$45,103	$766,751	$341,251	$ 52,500	$7,397
150,000	$ 262,500	$27,000	$636,550	$67,474	$1,147,063	$510,513	$ 78,750	$11,276
200,000	$ 350,000	$36,000	$847,600	$89,846	$1,527,376	$679,776	$ 105,000	$15,154
250,000	$ 437,500	$45,000	$1,058,650	$112,217	$1,907,688	$849,038	$ 131,250	$19,033

Note: The terms used in the tables above are for illustration only. Actual values would be generated during the audit and used in the audit quality control process to validate project viability and to help produce the letter of loan commitment prior to an owner authorizing retrofit design.

Set the PACE St. Louis

Draft Outline of Recommendations for Commercial Properties

The Set The PACE program will finance Energy Efficiency Measures (EEMs) in commercial buildings. Typical EEMs are listed below within typical payback timeframe categories:

Category 1 Short Payback (< Three Years)	Category 2 Medium Payback (4-6 Years)	Category 3 Long-Term Payback (7+ years)	Category 4 Special Situation (15+ year)
Schedule Changes (turn systems off when not needed)	Lighting Upgrades	Boiler Upgrade to condensing (Esp. Steam to hot water)	Boiler Upgrade to condensing (Esp. Steam to hot water)
Operating Setpoint changes (turn systems down when less capacity needed)	Control Changes (see Category 1)	Chiller Upgrades: Replace air cooled compressor system with water cooled.	Chiller Upgrades: Replace air cooled compressor system with water cooled.
Lighting Upgrades	Demand Control Ventilation (see Category 1)	Variable Frequency Drives (see Category 2)	Constant Air to Variable Air Volume (See Category 3)
Control Changes (provide mechanized means of making schedule changes or operating setpoint changes)	Variable Frequency Drives (modify heating and cooling drive and delivery systems – such as fans and pumps – to run at a variable volume rather than a constant volume	Direct Digital Controls (see Category 2)	New Dbl Glazed Windows
Demand Control Ventilation (install device to measure level of carbon dioxide in building air so that ventilation occurs only when needed)	Water Side Tower Economizer (if outdoor temperature and humidity is low enough, use cooling tower to make chilled water, instead of chiller, to provide cooling for building or process loads)	Constant Air to Variable Air Volume (more extensive upgrade than Variable Frequency Drives – involves installing control boxes within building ductwork to manage variances in volume of air flow)	Constant Air to Variable Air Volume (more extensive upgrade than Variable Frequency Drives – involves installing control boxes within building ductwork to manage variances in volume of air flow)
	Outdoor Air Economizer (see Category 1)	Tower Upgrades	Ground Source Heat Pump
Outdoor Air Economizer (install device that allows outdoor air to cool building when outside temperature and humidity are low enough)	Direct Digital Controls (provide a more automated mechanism for Control Changes – digital instead of analog or manual)	Water Side Tower Economizer (see Category 2)	Chiller Heat Recovery for Domestic Hot Water and summer reheat

Category 1 Short Payback (< Three Years)	Category 2 Medium Payback (4-6 Years)	Category 3 Long-Term Payback (7+ years)	Category 4 Special Situation (15+ year)
Exhaust Energy Recovery	Exhaust Energy Recovery	Exhaust Energy Recovery	Increase Wall and Roof Insulation
	High Albedo Roofing (reflects sunlight)	High Albedo Roofing (reflects sunlight)	
Green/Vegetated Roofs			
White, Cool, or Reflective Roofs			

As suggested in the table above, EEMs may have different payback timeframes depending on operating profiles, projected existing equipment life, and opportunities to upgrade equipment. Participants in the Set The PACE St. Louis program may be required to meet the additional criteria with respect to investment terms, such as the following:

1. All loans are required to provide positive cash flow to the building owner in the first year based on energy savings alone. This means that the annual energy cost savings will be greater than the principal and interest payments for the Set The PACE loan. Maintenance savings and life cycle cost savings are not to be considered in generating the required payback periods to qualify for loans.

2. Unless subsumed within Category 2 or Category 3 improvements, all recommended Category 1 improvements must be completed before any Category 2 or Category 3 improvements are eligible for financing under the Set The PACE St. Louis program.

3. The maximum loan term is 17 years. The loan term shall be, at most, twice the simple payback of combined Energy Efficiency Measures (EEMs) to be implemented. For example, if the simple payback of all of the EEMs implemented is 8 years, then the maximum loan term will be 16 years.

4. The recommended EEMs identified in a qualified audit must have a composite payback of at least 4 years. For example, items with short paybacks (Category 1) must be combined with items having medium or long term paybacks (up to 15 years) to bring the composite payback up to a minimum of 4 years.

5. Individual EEMs with paybacks longer than 15 years (Category 4) are not generally considered as candidates for this program unless they involve life cycle equipment replacement and/or it is an infrastructure redevelopment that will have long term benefits to the building. Such EEMs are to be blended with other (Category 1-3) EEMs so that the composite payback is less than or equal to 15 years. To the extent that the necessary loan term would otherwise exceed 17 years, the participant will be required to provide additional equity to finance a portion of the improvements.

6. Clients will provide releases allowing the Set The PACE St. Louis program access to their utility usage data prior to and for the term of the loan.

7. Program participants will provide access to the facility to verify implementation of all EEMs prior to the loan draws from the Set The PACE St. Louis program.

8. All commercial and industrial equipment and controls will be fully commissioned to demonstrate proper function prior to final loan draw.

ASHRAE Procedures for Commercial Building Energy Audits

PRELIMINARY ENERGY USE ANALYSIS

Before any level of energy analysis is begun, it is valuable to perform a preliminary energy use analysis to determine a building's current energy and cost efficiency relative to other, similar buildings. This is normally done by calculating the energy use and cost per square foot per year, which can indicate the potential value of further levels of analysis. This preliminary analysis generally includes the following steps.

1. Determine the building's gross conditioned square footage and record this on the building characteristics form. Classify the primary use of the building. Ensure that the standard definition of gross area is used.

2. Assemble copies of all utility bills and summarize them for at least a one-year period, preferably three years. Review the monthly bills for opportunities to obtain a better price through taking advantage of different utility rate classes.
Review the monthly patterns for irregularities. Note if a bill is missing or if it is estimated rather than actual consumption.

3. Complete the energy performance summary to develop the energy index and the cost index for each fuel, or demand type, and their combined total using ASHRAE Standard 105 methods.

4. Compare the Energy Utilization Index (EUI) and the cost index with buildings having similar characteristics. The owner of the subject building may have similar buildings for this comparison. Comparison should also be made with publicly available energy indices of similar buildings. In all cases, care should be taken to ensure that comparison is made with current data, using consistent definitions of building usage and floor area.

5. Derive target energy, demand, and cost indices for a building with the same characteristics as this building. A range of methods are available for this work:
- Pick from any database of similar buildings those buildings with the lowest energy index.
- Pick an index based on the knowledge of an energy analyst experienced with this type of building.

6. Compare the energy and cost savings for each fuel type if the building were to reach the target Energy Utilization Index. Using these value(s), determine if further engineering analysis is recommended.

LEVEL I – WALK-THROUGH ANALYSIS

This process includes all of the work done for the preliminary energy use analysis, plus the following.

1. Perform a brief walk-through survey of the facility to become familiar with its construction, equipment, operation, and maintenance.

2. Meet with owner/operator and occupants to learn of special problems or needs of the facility. Determine if any maintenance problems and/or practices may affect efficiency.

3. Perform a space function analysis, guided by the forms in the "Walk-Through Data" section. Determine if efficiency may be affected by functions that differ from the original functional intent of the building.

4. Perform a rough estimate to determine the approximate breakdown of energy use for significant end-use categories, including weather and non-weather related uses.

5. Identify low-cost/no-cost changes to the facility or to operating and maintenance procedures, and determine the savings that will result from these changes.

6. Identify potential capital improvements for further study, and provide an initial estimate of potential costs and savings.

The report for a Level I analysis should contain the building characteristics and energy use summary as well as the following.

1. Quantification of savings potential from changing to a different utility price structure.

2. Discussion of irregularities found in the monthly energy use patterns, with suggestions about their possible causes.

3. The energy index of similar buildings. Report the source, size, and date of the sample used in this comparison. The names of comparable buildings should be given if known.

4. The method used to develop the target indices. Where comparison is made to other buildings, state their names. Where the experience of someone other than the author is used to develop the target, provide the source. Where the target is developed by calculation, show the calculation or quote the name and version of software used and include both input and output data.

5. Total energy and demand cost by fuel type for the latest year and preceding two years if available. Show potential savings in dollars using the energy index format of ASHRAE Standard 105.

6. The fraction of current costs that would be saved if the energy index were brought to the target level.

7. A summary of any special problems or needs identified during the walkthrough survey, including possible revisions to operating and maintenance procedures.

8. A preliminary energy use breakdown by major end uses.

9. The listing of low-cost/no-cost changes with the savings for these improvements.

10. The potential capital improvements, with an initial estimate of potential costs and savings

LEVEL II—ENERGY SURVEY AND ENGINEERING ANALYSIS

This analytical procedure is guided by Level I analysis and includes the following additional work:

1. Review mechanical and electrical system design, installed condition, maintenance practices, and operating methods. Where drawings have been kept up to date, this task will be much easier.

2. Review existing operating and maintenance problems. Determine planned building changes.

3. Measure key operating parameters and compare to design levels, for example, operating schedules, heating/cooling water temperature, supply air temperature, space temperature and humidity, ventilation quantities, and light level at the task. Such measurements may be taken on a spot basis, or logged, manually or electronically.

4. Prepare a breakdown of the total annual energy use into end-use components, as illustrated in the *1999 ASHRAE Handbook—Applications*, Chapter 34, Figure 4, or as shown in the section "Energy Analysis Summary and Recommendations." A number of calculation methods are available, ranging from simplified manual calculations to fully detailed computer simulation of hour-by-hour building operations for a full year.

5. List all possible modifications to equipment and operations that would save energy. Select those that might be considered practical by the owner. List preliminary cost and savings estimates.

6. Review the list of practical modifications with the owner/operator and select those that will be analyzed further. Prioritize the modifications in the anticipated order of implementation.

7. For each practical measure, estimate the potential savings in energy cost and its energy index. To account for interaction between modifications, assume that modifications with the highest operational priority and/or best return on investment will be implemented first. A number of calculation methods are available, ranging from simplified manual calculations to rerunning computer simulations, if performed in Step 4, above.

8. Estimate the cost of each practical measure.

9. Estimate the impact of each practical measure on building operations, maintenance costs, and non-energy operating costs.

10. Estimate the combined energy savings from implementing all of the practical measures and compare to the potential derived in the Level I analysis. It should be clearly stated that savings from each modification are based on the assumption that all previous modifications have already been implemented and that the total savings account for
all of the interactions between modifications.

11. Prepare a financial evaluation of the estimated total potential investment using the owner's chosen techniques and criteria. These evaluations may be performed for each practical measure.

12. Following submission of the report of the Level II analysis, meet with the owner to discuss priorities and to help select measures for implementation or further analysis.

The report for a Level II analysis should contain at least the following.

1. A summary of energy use and cost associated with each end-use. Show calculations performed or quote the name and version of software used and include both input and output pages. Provide interpretation of differences between
actual total energy use and calculated or simulated end-use totals.

2. A description of the building, including typical floor plans and inventories of major energy-using equipment. (This information may be included as an appendix.)

3. A list of measures considered but felt to be impractical, with brief reasons for rejecting each.

4. For each practical measure, provide
• a discussion of the existing situation and why it is using excess energy;
• an outline of the measure, including its impact on occupant health,
comfort, and safety; a description of any repairs that are required for a measure to be effective;
• the impact on occupant service capabilities, such as ventilation for late occupancy or year-round cooling;
• an outline of the impact on operating procedures, maintenance procedures, and costs;
• expected life of new equipment, and the impact on the life of existing equipment;
• an outline of any new skills required in operating staff and training or hiring recommendations;
• calculations performed or provide the name and version of software used and include both input and output data.

5. A table listing the estimated costs for all practical measures, the savings, and financial performance indicator. For the cost of each measure, show the estimated accuracy of the value quoted. This table should spell out the assumed
sequence of implementation and state that savings may be quite different if a different implementation sequence is followed.

6. A discussion of any differences between the savings projected in this analysis and the estimated potential derived in the Level I analysis.

7. Overall project economic evaluation.

8. Recommended measurement and verification method(s) that will be required to determine the actual effectiveness of the recommended measures.

9. Discussion of feasible capital-intensive measures that may require a Level III analysis.

Exhibit C4

Potential Commercial Energy Contractor List

Set the PACE St. Louis

Exhibit C4

Potential Commercial Contractor List

Contractor Name	Service
ESTERLY, SCHNEIDER & ASSOCIATES, INC	Architect
ROSS & BARUZZINI, INC	Architect
CDG ENGINEERS ARCHITECTS PLANNERS, INC	Architect; Engineer
FARNSWORTH GROUP, INC	Architect; Engineer
TETRA TECH INC	Architect; Engineer; Energy Services
EAGLE ENERGY, INC	Building Automation Contractor
R & A CONTRACTING INC	Commercial Roofing
ABRAXAS ENERGY CONSULTING	Consulting
AIR POWER USA, INC	Consulting
COMPRESSED AIR TECHNOLOGIES	Consulting
AUTOMATIC CONTROLS EQUIPMENT SYSTEMS, INC	Controls Contractor
TITANOVA, INC	Diode laser processing
APPLIED INDUSTRIAL TECHNOLOGIES	Distributor
BAKER SYSTEMS, INC	Distributor
BUTLER SUPPLY, INC	Distributor
CAPE ELECTRICAL SUPPLY	Distributor
CITY ELECTRIC SUPPLY	Distributor
CITY LIGHTING PRODUCTS	Distributor
COMMUNITRONICS CORPORATION	Distributor
COX INDUSTRIAL EQUIPMENT, INC	Distributor
CRESCENT ELECTRIC SUPPLY COMPANY	Distributor
DAY & NIGHT SOLAR	Distributor
FRENCH GERLEMAN ELECTRIC	Distributor
FRENCH IMPLEMENT	Distributor
FROST ELECTRIC SUPPLY COMPANY	Distributor
GRAINGER, INC	Distributor
GRAINGER, INC	Distributor
GRAINGER, INC	Distributor
GRAINGER, INC	Distributor
GRAYBAR ELECTRIC COMPANY	Distributor
GRAYBAR ELECTRIC COMPANY	Distributor
HOLT ELECTRICAL SUPPLIES	Distributor
HTE TECHNOLOGIES	Distributor
HUGHES MACHINERY COMPANY	Distributor
INDOFF, INC	Distributor
LANGENDORF SUPPLY COMPANY INC	Distributor
MIDWEST ENERGY RESOLUTIONS	Distributor
MIDWEST LUMINATION	Distributor
NATIONAL ENERGY SOLUTIONS, INC	Distributor
NECTAR ENERGY SOLUTIONS	Distributor
PHILLIPS & COMPANY	Distributor
POWER SUPPLY INDUSTRIES, INC	Distributor

PRODUCTIVE TOOL PRODUCTS, INC	Distributor
STARBEAM SUPPLY COMPANY	Distributor
TION	Distributor
VANTAURA ENERGY SERVICES	Distributor
VILLA LIGHTING	Distributor
VOSS LIGHTING	Distributor
WES LED TECHNOLOGY, LLC	Distributor
WESTERN EXTRALITE COMPANY	Distributor
WLC ENTERPRISES, INC	Distributor
ST. LOUIS ENERGY SOLUTIONS LLC	Distributor; Energy Analysis; Lighting
LARSON & LARSON ENTERPRISES, INC	Distributor; Manufacturer's Rep
MASTERS EQUIPMENT SVC	Distributor; Manufacturer's Rep
MUNICIPAL EQUIPMENT COMPANY, INC	Distributor; Manufacturer's Rep
RICHARDS ELECTRIC MOTOR COMPANY	Distributor; Manufacturer's Rep
THERMAL MECHANICS, INC	Distributor; Manufacturer's Rep
PCA INFO SYSTEMS DBA ENERGYSAVER LED	Distributor; Retailer
SHD ENTERPRISES, INC DBA BATTERIES PLUS	Distributor; Retailer
LEO STRAATMANN FARM SERVICE	Distributor; Retailer; Electrical Contractor
ACCENT OUTDOOR LIGHTING	Electrical Contractor
ACE ELECTRICAL SOLUTIONS	Electrical Contractor
AELUX, LLC	Electrical Contractor
AMERICAN ELECTRIC & DATA, INC	Electrical Contractor
AMPTRON ELECTRIC COMPANY	Electrical Contractor
BATES ELECTRIC	Electrical Contractor
BEACH ELECTRIC COMPANY	Electrical Contractor
BELL ELECTRICAL CONTRACTORS	Electrical Contractor
BLUE SKIES ELECTRIC, LLC	Electrical Contractor
BLUESTAR ENERGY SERVICES	Electrical Contractor
BRANHAM ELECTRIC, INC	Electrical Contractor
BYRNE ELECTRIC COMPANY	Electrical Contractor
CASCO ELECTRIC, LLC	Electrical Contractor
CEC ELECTRICAL CONTRACTING	Electrical Contractor
CHILES ELECTRIC, INC	Electrical Contractor
CROWN ELECTRICAL CONTRACTING, INC	Electrical Contractor
DYALL ELECTRIC	Electrical Contractor
ELECTRIC UNLIMITED, LLC	Electrical Contractor
ELECTRICAL CONCEPTS, INC	Electrical Contractor
FRED'S ELECTRIC, LLC	Electrical Contractor
GUARANTEE ELECTRICAL COMPANY	Electrical Contractor
HADLER ELECTRIC	Electrical Contractor
HIGGINS ELECTRIC, INC	Electrical Contractor
HILL ELECTRIC LLC	Electrical Contractor
KAEMMERLEN ELECTRIC CONTRACTING	Electrical Contractor
KAISER ELECTRIC, INC	Electrical Contractor
KAY BEE ELECTRIC	Electrical Contractor
K-TECH	Electrical Contractor
LEON JAMES ELECTRIC	Electrical Contractor
LIBERTY ELECTRICAL, INC	Electrical Contractor
LIGHTING SERVICE, INC	Electrical Contractor
MAX ELECTRIC	Electrical Contractor

MCDOWELL ELECTRIC INC	Electrical Contractor
MID-AMERICA ELECTRIC, INC	Electrical Contractor
MISSOURI SOLAR APPLICATIONS, LLC	Electrical Contractor
NU-WAY LIGHTING	Electrical Contractor
ORION ELECTRIC LLC	Electrical Contractor
PAYNECREST ELECTRIC, INC.	Electrical Contractor
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ROGERS ELECTRIC SERVICE CORPORATION	Electrical Contractor
SANDERSON ELECTRIC, INC	Electrical Contractor
SCHEER SALES AND SERVICE, INC	Electrical Contractor
SHAWNEE ELECTRICAL CONTRACTORS, INC	Electrical Contractor
SOUTHERN ELECTRICAL SYSTEMS	Electrical Contractor
STIARWALT ELECTRIC, INC	Electrical Contractor
STREIB ELECTRIC COMPANY	Electrical Contractor
SUBURBAN ELECTRICAL SERVICES	Electrical Contractor
SUMMIT ELECTRIC	Electrical Contractor
TEX ELECTRICAL LLC	Electrical Contractor
THUNDER ELECTRIC	Electrical Contractor
VANLOO ELECTRIC, LLC	Electrical Contractor
ZAK COMPANIES, INC	Electrical Contractor
STONE HILL ENERGY	Electrical Contractor; CEM; CEA; CDSM
FSG LIGHTING	Electrical Contractor; Distributor
INNOVATIVE FACILITIES SOLUTIONS, LLC	Electrical Contractor; Distributor
BUDGET LIGHTING, INC	Electrical Contractor; Distributor; Retailer
ASCHINGER ELECTRIC COMPANY	Electrical Contractor; Engineer
SUPERIOR LIGHTING, LLC	Electrical Contractor; Engineer
BICK GROUP INC	Electrical Contractor; Engineer; Mechanical Contractor
X-LIGHT MANUFACTURING PARTNERSHIP d/b/a XTRA LIGHT SERVICES	Electrical Contractor; Manufacturer; Engineer
DAVEER ELECTRICAL & MECHANICAL CONTRACTING INC	Electrical Contractor; Mechanical Contractor
DOLL SERVICES	Electrical Contractor; Mechanical Contractor
ILLINOIS ELECTRIC WORKS	Electrical Contractor; Mechanical Contractor; Distributor
CONSOLIDATED EDISON SOLUTIONS, INC	Electrical Contractor; Mechanical Contractor; Engineer
BLACK JACK ELECTRICAL SERVICE CO	Electrical Contractor; PV: Solar Installs
SYNERGY ELECTRIC, LLC	Electrical Contractor; Retailer; Distributor
BOCO, INC	Electrical Engineer
BRIGHT IDEA ENERGY SOLUTIONS, LLC	Energy Services
8760 ENGINEERING, LLC	Engineer
ASERUSA	Engineer
FACILITY MANAGEMENT SOLUTIONS, LLC	Engineer
FACILITY SOLUTIONS GROUP	Engineer
G & W ENGINEERING CORPORATION	Engineer
GREENWAY 106	Engineer
HENNEMAN ENGINEERING, INC	Engineer
HORIZON ENGINEERING ASSOCIATES, LLP	Engineer
SCHNEIDER ELECTRIC	Engineer
SITTON CONSULTING GROUP, LLC	Engineer

STRICKLAND ENGINEERING, LLC	Engineer
TAC AMERICAS, INC	Engineer
WPCS INTERNATIONAL, INC	Engineer
SACHS ELECTRIC COMPANY	Engineer; Electrical Contractor
SOLUTIONS, INC	Engineer; Electrical Contractor
CONTROL TECHNOLOGY & SOLUTIONS	Engineer; General Contractor
WIEGMANN AND ASSOCIATES	Engineer; Mechanical Contractor
ENERGY SAVINGS SOLUTIONS	ESCO
OPTIMUM LIGHTING, LLC	Fixture Manufacturer
KOZENY WAGNER	General Contractor
ROBINSON SOLUTIONS, INC	General Contractor
TRUMPET LLC	General Contractor
FDC OXEN, INC	General Contractor LEED AP
COMMERCIAL LIGHTING SYSTEMS, LLC	Lighting Services and Sales
ADVANCED BLENDING SOLUTIONS, LLC	Manufacturer
AIRTEX, LLC D/B/A ENGINEERED AIR, INC	Manufacturer
ARCHITECTURAL BRONZE STUDIO, INC	Manufacturer
ATLAS COPCO COMPRESSOR, LLC	Manufacturer
CAMBRIDGE ENGINEERING, INC	Manufacturer
EMERSON MOTOR TECHNOLOGIES	Manufacturer
GREEN ENERGY MASTERS	Manufacturer
GREENWAY DESIGN GROUP	Manufacturer
H & H LIGHTING COMPANY	Manufacturer
KAESER COMPRESSORS, INC	Manufacturer
ORION ENERGY SYSTEMS INC	Manufacturer
SAGE LIGHTING LTD	Manufacturer
SANDIN ENGINEERING	Manufacturer
SIEMENS INDUSTRY INC	Manufacturer
STAMFORD SCIENTIFIC INTERNATIONAL, INC	Manufacturer
TCP, INC	Manufacturer
TOSHIBA INTERNATIONAL CORPORATION	Manufacturer
STANDARD PNEUMATIC PRODUCTS INC	Manufacturer; Compr Air Systems
ENVIRONMENTAL DYNAMICS, INC	Manufacturer; Consulting Services
GREENWIZE ENERGY SOLUTIONS	Manufacturer; Distributor; Manufacturer's Rep
BAYS CONTROLS LLC	Manufacturer; Engineer
LIME ENERGY	Manufacturer; Engineer
MIRROR LIGHTING, INC	Manufacturer; ESCO Company
CARRIER CORPORATION	Manufacturer; Manufacturers Rep
SSL LIGHTING	Manufacturer; Manufacturer's Rep
BULLDOG ENERGY	Manufacturer's Rep
C & C SALES, INC	Manufacturer's Rep
ELECTRONIC SUPPORT SYSTEMS	Manufacturer's Rep
ENGINEERED THERMAL SYSTEMS	Manufacturer's Rep
ENVIROTECH	Manufacturer's Rep
FRIESEN INFRARED ENERGY	Manufacturer's Rep
LIFEWORKS ENVIRONMENTAL LIGHTING	Manufacturer's Rep
LIGHTING ASSOCIATES, INC	Manufacturer's Rep
LUIKART-EASON-CALCATERRA & COMPANY	Manufacturer's Rep
MIDWEST MACHINERY COMPANY	Manufacturer's Rep

MOTOR CONTROL SPECIALTIES, INC	Manufacturer's Rep
PEIKER-PIATCHEK ASSOCIATES, INC.	Manufacturer's Rep
RESSLER & ASSOCIATES	Manufacturer's Rep
SCHAEFFER MARKETING GROUP	Manufacturer's Rep
SINGER LED SOLUTIONS, LLC	Manufacturer's Rep
THE MCPHERSON GROUP LLC	Manufacturer's Rep
VECTOR ELECTRICAL SALES	Manufacturer's Rep
PREMIUM PRODUCTS AND INSTALLATIONS	Manufacturer's Rep; Distributor
CONDIT COMPANY, INC	Manufacturer's Rep; Distributor; Mechanical Contractor
AIR PRO HEATING & COOLING, LLC	Mechanical Contractor
ALBERT ARNO, INC	Mechanical Contractor
ANTON'S AIR CONDITIONING & HEATING	Mechanical Contractor
BUSH REFRIGERATION	Mechanical Contractor
C&R MECHANICAL COMPANY	Mechanical Contractor
CUSTOM COMFORT HEATING AND COOLING	Mechanical Contractor
DAWSON-DODD INC	Mechanical Contractor
DUCT SYSTEMS INC	Mechanical Contractor
HALBERT, INC	Mechanical Contractor
HAROLD G. BUTZER, INC	Mechanical Contractor
HOFFMANN BROTHERS	Mechanical Contractor
HUSSMANN-INGERSOLL RAND	Mechanical Contractor
INDOOR COMFORT TEAM LLC	Mechanical Contractor
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MARTIN-JETCO HEATING & AIR CONDITIONING	Mechanical Contractor
MERAMEC MECHANICAL, INC	Mechanical Contractor
MID-MISSOURI HEATING AND COOLING, INC	Mechanical Contractor
MIDWEST MECHANICAL SERVICES	Mechanical Contractor
PIPE SYSTEMS MECHANICAL LLC	Mechanical Contractor
R. F. SCHRAUT HEATING AND COOLING	Mechanical Contractor
SCHRAER HEATING & AIR CONDITIONING	Mechanical Contractor
SHEET METAL CONTRACTORS	Mechanical Contractor
MAX MECHANICAL CONTRATORS, INC.	Mechanical Contractor; Distributor
G2POWER TECHNOLOGIES	Mechanical Contractor; Distributor; Retailer
SYSTEMAIRE, INC	Mechanical Contractor; Engineer
TRISTATE MECHANICAL SERVICES, INC	Mechanical Contractor; Engineer
SCOTT & SON DRILLING, LLC	Mechanical Contractor; Geothermal; Water Conservation
PREMIUM MECHANICAL AND AUTOMATION, INC	Mechanical Contractor; Manufacturer's Rep; Building Automation
SSC ENGINEERING, INC	Principal
MISSOURI ENTERPRISE	RCx Agent
DOW ENVIRONMENT PROTECTION	Retailer
MARTH BROTHERS COMPANY	Retailer
WILLIAMS ENTERPRISES	Retailer
WHITE CAPS, GREEN COLLARS LLC	Roof Coating Contractor
ENERGY GROUP, LLC	Technical Analysis Provider (TAP)
ENERGY SOLUTIONS, INC	Technical Analysis Provider (TAP);
CANNON DESIGN	Technical Analysis Provider (TAP);Architect
HURST-ROSCHE ENGINEERS, INC	Technical Analysis Provider (TAP); Architect; Engineer

WILLIAM TAO AND ASSOCIATES, INC	Technical Analysis Provider (TAP); Architect; Engineer
BI-STATE COMPRESSOR	Technical Analysis Provider (TAP); Distributor
INFORMATION SECURITY NETWORKS	Technical Analysis Provider (TAP); Distributor
REXEL ELECTRICAL SUPPLIES	Technical Analysis Provider (TAP); Distributor
SPACE CONSULTANTS LLC	Technical Analysis Provider (TAP); Distributor
M360	Technical Analysis Provider (TAP); Distributor
CHARLES E JARRELL & ASSOCIATES	Technical Analysis Provider (TAP); Electrical
MISSOURI VALLEY RENEWABLE ENERGY	Technical Analysis Provider (TAP); Electrical
EATON CORPORATION	Technical Analysis Provider (TAP); Energy Analysis; HVAC; Lighting
BUTTERFLY ENERGY WORKS	Energy Consultants & Auditors
ENERGYCHEK INTERNATIONAL, LLC	Technical Analysis Provider (TAP); Energy Services; Consulting
AE ASSOCIATES, INC	Technical Analysis Provider (TAP); Engineer
BURNS & MCDONNELL	Technical Analysis Provider (TAP); Engineer
CXE GROUP, LLC	Technical Analysis Provider (TAP); Engineer
MICROGRID ENERGY, LLC	Technical Analysis Provider (TAP); Engineer
UTILIVATE TECHNOLOGIES LLC	Technical Analysis Provider (TAP); Engineer
ZELLER TECHNOLOGIES	Engineer; Electrical Contractor; Manufacturers Rep
SOLUTION DYNAMICS	Engineer; Retro-Commissioning Agent
GATEWAY ELECTRICAL SALES, INC.	Technical Analysis Provider (TAP);Manufacturer's Rep
AIR MASTERS CORPORATION	Technical Analysis Provider (TAP); Mechanical Contractor
TALISEN TECHNOLOGIES, INC	Technology Integrator
URBAN LEAGUE OF METROPOLITAN ST. LOUIS	Weatherization Services
ALLIANCE ENERGY SOLUTIONS	
H & H INDUSTRIES, INC	
JOHN HENRY FOSTER	
JOHNSON CONTROLS COMPANY	
LAKE AREA ELECTRICAL SERVICES LLC	
MANAGEMENT ALTERNATIVES	
METRO ELECTRIC SUPPLY	
REINHOLD ELECTRIC INC	
SCHAEFFER ELECTRIC COMPANY, INC	
STORK FABRICATORS	
THERMAL REFRIGERATION, INC	
TRANE	

Exhibit C5

ASHRAE Technical Specifications

Procedures for Commercial Building Energy Audits

This publication was prepared under ASHRAE Research Project RP-669 and ASHRAE Special Project SP-56 in cooperation with TC 9.6, Systems Energy Utilization (now TC 7.6).

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Contents

Preface

This publication has been developed as a result of two earlier assessments of the energy auditing process in commercial buildings by ASHRAE.[1, 2] Special Project 56 developed the scope of work for various levels of analysis, and Research Project 669 developed a standard format for reporting the results of analysis.

In combining the results of these assessments, the purpose of this publication is twofold:

1. To provide purchasers and providers of energy audit services with a complete definition of good procedures for an energy survey and analysis.
2. To provide a format for defining buildings and their energy use that will allow data to be shared in meaningful ways.

This publication addresses these needs through the description of typical procedures for each level of analysis and uniform means of reporting building, system, and energy use characteristics, as well as the results of the analysis.

No attempt has been made to prescribe field survey methods or the analytical tools to be used. This publication specifically avoids a "cookbook" approach, recognizing that all buildings are different and each analyst needs to exercise a substantial amount of judgment. Instead, this publication sets out generalized procedures to guide the analyst and the building owner and provides a uniform method of reporting basic information.

The readers' attention is called to the forms in sections entitled "Preliminary Energy Use Analysis" and "Walk-Through Data." These forms utilize standard definitions for building area, building type, and energy use. In addition, data are requested on the various space functions and systems in the building. By standardizing definitions and reporting methods, it is intended that the information requested can contribute to the establishment of a large, useful database of building functions and energy use. Highlighted areas on the forms were incorporated into a trial database by Research Project 669. Therefore, the analyst is urged to provide all possible information in these two sections in the format provided.

Other ASHRAE documents that would be useful in completing a comprehensive engineering energy analysis are:

- *2003 ASHRAE Handbook—HVAC Applications*, chapter 35, "Energy Use and Management" and chapter 40, "Building Energy Monitoring."
- ASHRAE Standard 100–1995, Energy Conservation in Existing Buildings.
- ASHRAE Standard 105–1984 (RA 90), Standard Methods of Measuring and Expressing Building Energy Performance.

1. An assessment of the Energy Auditing Process in Commercial Buildings, SP-56 Report to Pacific Northwest laboratory, December 1987.
2. ASHRAE Research Project 669: Evaluation of Proposed ASHRAE Energy Audit Forms and Procedures, 1997.

Acknowledgments

This publication is the result of ongoing efforts by the Systems Energy Utilization Technical Committee (TC 9.6 through most of the work on this project; renumbered to TC 7.6 in 2003) to develop definitions of good procedures for energy survey and analysis, and to provide a format for defining buildings and their energy use, to allow data to be shared in meaningful ways.

The effort to have the technical research of the TC made available in an ASHRAE Special Publication was led by TC member Dick Pearson. Significant input and leadership came from Ish Sud during his tenure as TC chair and since, and TC member John Cowan. Mike MacDonald, Bob Fuller, Hashem Akbari, Dieter Bartel, Wayne Robertson, and others, have provided useful comments along the process of development. The TC approved publication of the document in June 1999.

Adam Hinge
Chair, TC 7.6, Systems Energy Utilization
April 2004

The Energy Audit Process

OBJECTIVES

The objectives of an energy analysis or audit are to identify and develop modifications that will reduce the energy use and/or cost of operating a building. The results should be presented in a format that will provide the information needed by an owner/operator to decide if any, some, or all of the recommended modifications should be implemented. An energy analysis includes the following steps:

1. Collect and analyze historical energy use.
2. Study the building and its operational characteristics.
3. Identify potential modifications that will reduce the energy use and/or cost.
4. Perform an engineering and economic analysis of potential modifications.
5. Prepare a rank-ordered list of appropriate modifications.
6. Prepare a report to document the analysis process and results.

OUTLINE

The key elements of a commercial building energy audit/analysis are as follows:

1. Analysis of two or more years of utility consumption and cost, review of building plans, and a walk-through of the building itself to establish:
   - Type of building, principal use, and area, ft^2.
   - Energy Utilization Index (EUI): (annual energy use) kBtu/ft^2 per year.
   - Cost index: \$/ft^2 per year.
   - Breakdown of various spaces within the building by function, hours of use, and area.
   - Determine if efficiency may be affected by building functions that differ from the original functional intent of the building.
   - Determine if any maintenance problems or practices may affect efficiency.
   - Comparison of energy and cost indices of the building with one or more databases.
2. Description and analysis of the energy-using systems of the building, resulting from on-site observation, measurement, and engineering calculations, including:
   - Envelope
   - Lighting
   - HVAC
   - Domestic hot water
   - Laundry
   - Food preparation

- Conveying systems
- Other systems

3. As a result of engineering analysis and economic calculations, develop:
   - Breakdown of the components of annual energy use and cost.
   - Recommended energy conservation measures, including predicted savings and cost to implement.
   - A description and cost estimate of repairs that are needed in order for energy conservation measures to be effective.
   - A description and cost estimate of measurement and verification methods needed to determine the actual effectiveness of measures.
   - Energy analysis summary:
     - Present energy use and cost
     - Ultimate target for energy use and cost
     - Savings from recommended measures
     - Comparison of current recommendations to ultimate target

PROCEDURES

An engineering energy audit/analysis of a facility should provide sufficient information for the owner/operator and/or manager of a facility to understand the energy use characteristics of the building. This analysis breaks down the total energy use and cost for the facility into various end uses, such as heating, air conditioning, lighting, etc., and shows the potential for savings.

The engineering analysis should also provide the owner/operator with all information needed to commit necessary resources to reduce the building's energy use and/or cost. This includes outlining any changes in the facility's operation and maintenance, including different personnel requirements, as well as presenting an economic analysis of any capital improvement projects.

The engineering analyst is encouraged to follow a systematic approach in identifying, selecting, and ranking recommended measures. However, the appropriateness of a measure depends not only on technical issues but also on institutional and organizational issues, such as the regulatory environment, financing options, and occupant requirements. Therefore, a modification to a piece of equipment or an activity that is highly effective under some conditions may have little or no effect under others.

Different levels of energy analysis can be performed on any given building, or group of buildings, providing information that may be used for widely varying purposes. A building owner contemplating major energy-saving capital improvements will need a significantly higher level of confidence in the analysis than an owner who simply wishes to compare the level of efficiency of the building relative to other, similar buildings.

As a result, the levels of analysis have been organized into the following categories:

- Preliminary Energy Use Analysis
- Level I Analysis—Walk-Through Analysis
- Level II Analysis—Energy Survey and Analysis
- Level III Analysis—Detailed Analysis of Capital Intensive Modifications

The different levels are described here, along with the typical process of analysis and report contents for each level. Each succeeding level of analysis builds upon the previous level. A joint decision should be made by the building owner and energy analyst as to the level that is appropriate for the owner's needs.

This publication is intended to provide guidance to engineering energy analysts and to provide some standardization of the results of the analysis. It will also be useful to building owners and operating staff to provide an understanding of results that can be expected from the engineering analyst, as well as the level of analysis that may be appropriate for a facility.

ORGANIZING DATA

The forms to be used with an energy analysis are generalized and presented as *sections* of a typical report in subsequent portions of this publication. It is intended that the forms in each of the four sections be utilized whenever an energy analysis is performed, although a Level I analysis (walk-through) will make little or no use of the forms in the section on "Building and Systems Report." As the engineering analysis becomes more rigorous, so does the use of the forms. They are summarized in the following sections.

Preliminary Energy Use Analysis[1]

The utility data and general building characteristics required in the "Preliminary Energy Use Analysis" section can usually be obtained from the owner/operator of the building before a visit to the building. The forms can be used to develop energy and cost indices, to compare with similar buildings and to make a rough determination of the benefits of further analysis.

Walk-Through Data[1]

The information required in the "Walk-Through Data" section includes information on space functions and systems, which can be obtained without conducting a detailed analysis of the building. Highlighted areas in these sections have been incorporated into a trial database by ASHRAE Research Project 669.

Building and Systems Report

This section is intended to provide guidance to the analyst as to the type of information to be collected and presented. No attempt is made to suggest methods of data collection or to specify a format for presentation.

Energy Analysis Summary and Recommendations

This section provides a format for reporting the results and recommendations of an analysis, including a component breakdown of energy use and recommended energy conservation measures, accompanied by an estimate of capital cost and savings for each recommendation. System interaction must be properly accounted for when combining more than one modification. The economics of each modification may vary, depending upon the order in which they are accomplished.

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1. The development of the uniform reporting methods in these two sections will facilitate sharing of data and may eventually lead to the development of a building energy and functional usage database for use by the profession.

Levels of Effort

Depending on the physical and energy-use characteristics of a building and the needs and resources of the owner, these steps can require different levels of effort. A commercial building energy analysis can generally be classified into the following levels of effort.

OVERVIEW

Preliminary Energy Use Analysis

Analyze historic utility use and cost. Develop the Energy Utilization Index (EUI) of the building. Compare the building EUI to similar buildings to determine if further engineering study and analysis are likely to produce significant energy savings.

Level I—Walk-Through Analysis

Assess a building's energy cost and efficiency by analyzing energy bills and conducting a brief on-site survey of the building. A Level I energy analysis will identify and provide a savings and cost analysis of low-cost/no-cost measures. It will also provide a listing of potential capital improvements that merit further consideration, and an initial judgment of potential costs and savings. A walk-through analysis of a facility will utilize all the forms in this publication except those in the section on "Building and Systems Report."

Level II—Energy Survey and Analysis

This includes a more detailed building survey and energy analysis. A breakdown of the energy use within the building is provided. A Level II energy analysis will identify and provide the savings and cost analysis of all practical measures that meet the owner's constraints and economic criteria, along with a discussion of any changes to operation and maintenance procedures. It may also provide a listing of potential capital-intensive improvements that require more thorough data collection and engineering analysis, and a judgment of potential costs and savings. This level of analysis will be adequate for most buildings and measures.

Level III—Detailed Analysis of Capital-Intensive Modifications

This level of engineering analysis focuses on potential capital-intensive projects identified during the Level II analysis and involves more detailed field data gathering as well as a more rigorous engineering analysis. It provides detailed project cost and savings calculations with a high level of confidence sufficient for major capital investment decisions.

Discussion

There are not sharp boundaries between these levels. They are general categories for identifying the type of information that can be expected and an indication of the level of confidence in the results. It is possible that while performing an energy analysis in a particular building, various measures may be subjected to different levels of analysis.

Some readers of an energy analysis report may be unable to comprehend the technical analysis involved, while others may demand a full presentation of the analysis for critique. Consequently, technical material should be presented in an appendix to the report, while the body of the report guides the reader through the technical material and summarizes the findings.

Information presented here outlines the engineering procedures that should be followed while performing an energy analysis. It is assumed that the analyst is a knowledgeable and competent individual. No attempt is made in this publication to prescribe specific methods of data gathering or data analysis.

To assist with the organization of the data collected and the calculation procedures, this publication contains guideline forms that suggest the type of data to be gathered and its organization. It is recommended that the analyst develop and use appropriate data collection and organization forms specific to the size and type of building(s) being analyzed.

The forms presented in the first two sections are building characteristic forms on which basic building information and energy use can be recorded. Use of these forms by all engineering analysts will result in a uniform procedure for reporting the results of an analysis. It is recommended that these forms be completed without modification.

PRELIMINARY ENERGY USE ANALYSIS

Before any level of energy analysis is begun, it is valuable to perform a preliminary energy use analysis to determine a building's current energy and cost efficiency relative to other, similar buildings. This is normally done by calculating the energy use and cost per square foot per year, which can indicate the potential value of further levels of analysis. This preliminary analysis generally includes the following steps.

1. Determine the building's gross conditioned square footage and record this on the building characteristics form. Classify the primary use of the building. Ensure that the standard definition of gross area is used.
2. Assemble copies of all utility bills and summarize them for at least a one-year period, preferably three years. Review the monthly bills for opportunities to obtain a better price through taking advantage of different utility rate classes. Review the monthly patterns for irregularities. Note if a bill is missing or if it is estimated rather than actual consumption.
3. Complete the energy performance summary to develop the energy index and the cost index for each fuel, or demand type, and their combined total using ASHRAE Standard 105 methods.
4. Compare the Energy Utilization Index (EUI) and the cost index with buildings having similar characteristics. The owner of the subject building may have similar buildings for this comparison. Comparison should also be made with publicly available energy indices of similar buildings. In all cases, care should be taken to ensure that comparison is made with current data, using consistent definitions of building usage and floor area.
5. Derive target energy, demand, and cost indices for a building with the same characteristics as this building. A range of methods are available for this work:
    - Pick from any database of similar buildings those buildings with the lowest energy index.
    - Pick an index based on the knowledge of an energy analyst experienced with this type of building.
6. Compare the energy and cost savings for each fuel type if the building were to reach the target Energy Utilization Index. Using these value(s), determine if further engineering analysis is recommended.

LEVEL I—WALK-THROUGH ANALYSIS

This process includes all of the work done for the preliminary energy use analysis, plus the following.

1. Perform a brief walk-through survey of the facility to become familiar with its construction, equipment, operation, and maintenance.
2. Meet with owner/operator and occupants to learn of special problems or needs of the facility. Determine if any maintenance problems and/or practices may affect efficiency.
3. Perform a space function analysis, guided by the forms in the "Walk-Through Data" section. Determine if efficiency may be affected by functions that differ from the original functional intent of the building.
4. Perform a rough estimate to determine the approximate breakdown of energy use for significant end-use categories, including weather and non-weather-related uses.
5. Identify low-cost/no-cost changes to the facility or to operating and maintenance procedures, and determine the savings that will result from these changes.
6. Identify potential capital improvements for further study, and provide an initial estimate of potential costs and savings.

The report for a Level I analysis should contain the building characteristics and energy use summary as well as the following.

1. Quantification of savings potential from changing to a different utility price structure.
2. Discussion of irregularities found in the monthly energy use patterns, with suggestions about their possible causes.
3. The energy index of similar buildings. Report the source, size, and date of the sample used in this comparison. The names of comparable buildings should be given if known.
4. The method used to develop the target indices. Where comparison is made to other buildings, state their names. Where the experience of someone other than the author is used to develop the target, provide the source. Where the target is developed by calculation, show the calculation or quote the name and version of software used and include both input and output data.
5. Total energy and demand cost by fuel type for the latest year and preceding two years if available. Show potential savings in dollars using the energy index format of ASHRAE Standard 105.
6. The fraction of current costs that would be saved if the energy index were brought to the target level.
7. A summary of any special problems or needs identified during the walk-through survey, including possible revisions to operating and maintenance procedures.
8. A preliminary energy use breakdown by major end uses.
9. The listing of low-cost/no-cost changes with the savings for these improvements.
10. The potential capital improvements, with an initial estimate of potential costs and savings

LEVEL II—ENERGY SURVEY AND ENGINEERING ANALYSIS

This analytical procedure is guided by Level I analysis and includes the following additional work:

1. Review mechanical and electrical system design, installed condition, maintenance practices, and operating methods. Where drawings have been kept up to date, this task will be much easier.

2. Review existing operating and maintenance problems. Determine planned building changes.
3. Measure key operating parameters and compare to design levels, for example, operating schedules, heating/cooling water temperature, supply air temperature, space temperature and humidity, ventilation quantities, and light level at the task. Such measurements may be taken on a spot basis, or logged, manually or electronically.
4. Prepare a breakdown of the total annual energy use into end-use components, as illustrated in the *1999 ASHRAE Handbook—Applications*, Chapter 34, Figure 4, or as shown in the section "Energy Analysis Summary and Recommendations." A number of calculation methods are available, ranging from simplified manual calculations to fully detailed computer simulation of hour-by-hour building operations for a full year.
5. List all possible modifications to equipment and operations that would save energy. Select those that might be considered practical by the owner. List preliminary cost and savings estimates.
6. Review the list of practical modifications with the owner/operator and select those that will be analyzed further. Prioritize the modifications in the anticipated order of implementation.
7. For each practical measure, estimate the potential savings in energy cost and its energy index. To account for interaction between modifications, assume that modifications with the highest operational priority and/or best return on investment will be implemented first. A number of calculation methods are available, ranging from simplified manual calculations to rerunning computer simulations, if performed in Step 4, above.
8. Estimate the cost of each practical measure.
9. Estimate the impact of each practical measure on building operations, maintenance costs, and non-energy operating costs.
10. Estimate the combined energy savings from implementing all of the practical measures and compare to the potential derived in the Level I analysis. It should be clearly stated that savings from each modification are based on the assumption that all previous modifications have already been implemented and that the total savings account for all of the interactions between modifications.
11. Prepare a financial evaluation of the estimated total potential investment using the owner's chosen techniques and criteria. These evaluations may be performed for each practical measure.
12. Following submission of the report of the Level II analysis, meet with the owner to discuss priorities and to help select measures for implementation or further analysis.

The report for a Level II analysis should contain at least the following.

1. A summary of energy use and cost associated with each end-use. Show calculations performed or quote the name and version of software used and include both input and output pages. Provide interpretation of differences between actual total energy use and calculated or simulated end-use totals.
2. A description of the building, including typical floor plans and inventories of major energy-using equipment. (This information may be included as an appendix.)
3. A list of measures considered but felt to be impractical, with brief reasons for rejecting each.
4. For each practical measure, provide
    - a discussion of the existing situation and why it is using excess energy;
    - an outline of the measure, including its impact on occupant health, comfort, and safety;

- a description of any repairs that are required for a measure to be effective;
- the impact on occupant service capabilities, such as ventilation for late occupancy or year-round cooling;
- an outline of the impact on operating procedures, maintenance procedures, and costs;
- expected life of new equipment, and the impact on the life of existing equipment;
- an outline of any new skills required in operating staff and training or hiring recommendations;
- calculations performed or provide the name and version of software used and include both input and output data.

5. A table listing the estimated costs for all practical measures, the savings, and financial performance indicator. For the cost of each measure, show the estimated accuracy of the value quoted. This table should spell out the assumed sequence of implementation and state that savings may be quite different if a different implementation sequence is followed.
6. A discussion of any differences between the savings projected in this analysis and the estimated potential derived in the Level I analysis.
7. Overall project economic evaluation.
8. Recommended measurement and verification method(s) that will be required to determine the actual effectiveness of the recommended measures.
9. Discussion of feasible capital-intensive measures that may require a Level III analysis.

LEVEL III—DETAILED ANALYSIS OF CAPITAL-INTENSIVE MODIFICATIONS

This analytical procedure is guided by Levels I and II analyses and the owner's selection of measures for greater definition. It must follow such Level I and II work.

1. Expand definition of all modifications requiring further analysis.
2. Review measurement methods, and perform additional testing and monitoring as required to allow determination of feasibility.
3. Perform accurate modeling of proposed modifications. Ensure that modeling includes system interaction.
4. Prepare a schematic layout of each of the modifications.
5. Estimate the cost and savings of each modification.
6. Meet with owner to discuss/develop recommendations.

The report for a Level III analysis should include the following, as a minimum.

1. Include text, schematics, and equipment lists necessary to completely describe all proposed changes to physical equipment. Matters of a final design nature may be left to subsequent engineering as long as the cost of such engineering is included in the budget. Firm price contractor quotations for key parts of any measure may be included. Cost estimates shall show contingencies separately and report the expected accuracy of the budget.
2. Prepare a financial evaluation of the estimated capital investment and projected savings. Use the owner's chosen techniques and criteria.

Guideline Forms

The following pages illustrate the suggested arrangement and content in providing a complete energy analysis report and recommendations. In this portion of this publication, explanatory material is included on the forms.

Preliminary Energy Use Analysis

The data required in this section can usually be obtained from the owner/operator of the building before a visit to the building. The forms utilize standard definitions for building area, building type, and energy use. The result is the development of energy and cost indices, which can be used to compare with other, similar buildings, and to make a rough determination of the benefit of further analysis.

It is intended that the information requested can contribute to the establishment of a useful database of building energy use. Therefore, the analyst is strongly urged to provide all possible information ***in the format provided.*** Shaded areas indicate information that is input into the database.

BUILDING CHARACTERISTICS

Building ID _____ Date of Audit: _____

City _____ State/Prov. _____ Zip/Post _____

Lat. _____ Long. _____ HDD _____ CDD _____ (Base 65°F) _____ (Year of Data)

Gross Floor Area,[1] _____ ft^2 Total Conditioned Area[1] _____ ft^2

Conditioned Area,[1] heated only _____ ft^2 Conditioned Area,[1] cooled only _____ ft^2

Conditioned Area,[1] heated & cooled _____ ft^2

Number of conditioned floors: Above grade _____ Below grade _____

Year of Construction[2]: _____

Brief Building Description: _____

PRIMARY BUILDING TYPE[3] (check one only)

Office	11 [ ] Owner Occupied	
	12 [ ] Leased (1-5 Tenants)	
	13 [ ] Leased (5+ Tenants)	
	19 [ ] Other—Define	
Hotel/Motel	21 [ ] Motel (No Food)	
	22 [ ] Hotel	
	23 [ ] Hotel/Convention	
	29 [ ] Other—Define	
Apartment	31 [ ] General Occupancy	
	32 [ ] Seniors Only	
	39 [ ] Other—Define	
Education	41 [ ] Primary	
	42 [ ] Secondary	
	43 [ ] University	
	49 [ ] Other—Define	
Food Services	51 [ ] Restaurant - Full Service	
	52 [ ] Fast Food	
	53 [ ] Take Out	
	54 [ ] Lounge	
	59 [ ] Other—Define	
Health Care	61 [ ] Nursing Home	
	62 [ ] Psychiatric	
	63 [ ] Clinic	
	64 [ ] Active Treatment Hospital	
	69 [ ] Other—Define	
Retail	71 [ ] Drycleaning	
	72 [ ] Supermarket	
	73 [ ] General Merchandise	
	74 [ ] Shopping Mall Without Tenant Loads	
	75 [ ] Shopping Mall Without Tenant Lighting Loads	
	76 [ ] Shopping Mall	
	77 [ ] Specialty Shop	
	78 [ ] Bakery	
	79 [ ] Other—Define	
Assembly	81 [ ] Theatre	
	82 [ ] Museum/Gallery	
	83 [ ] Church/Synagogue	
	84 [ ] Arena/Gym	
	85 [ ] Arena/Rink	
	89 [ ] Other—Define	
Other	91 [ ] Laboratory	
	92 [ ] Warehouse	
	93 [ ] Warehouse—Refrigerated	
	94 [ ] Recreation/Athletic Facility	
	95 [ ] Jail	
	96 [ ] Transport Terminal	
	97 [ ] Multi-Use. Complex	
	99 [ ] Other—Define	

1. GROSS FLOOR AREA is all floor area contained within the outside finished surface of permanent outer building walls including basements, mechanical equipment floors, and penthouses (*ANSI Standard Z65.1-1996, Construction Area*). No exclusions are made for shafts, stairs, or atria. CONDITIONED AREA is that area provided with heating or cooling to maintain temperature between 50°F and 86°F (*ANSI/ASHRAE Standard 105-1984*).
2. THE MEDIAN YEAR for construction of at least 51% of the conditioned space.
3. BUILDING TYPE as characterized by at least 51% of the conditioned space.

ENERGY PERFORMANCE SUMMARY _____ (YEAR)

This is a summary of energy account worksheets on succeeding pages.

ENERGY TYPE	TOTAL ANNUAL USE	UNITS	CONVERSION MULTIPLIER To Thousands Btu See Page 17	THOUSANDS BTU (kBtu)	TOTAL ANNUAL COST ($)
ELECTRICITY					
NATURAL GAS					
PURCHASED STEAM					
PURCHASED HOT WATER					
PURCHASED CHILLED WATER					
OIL # _____					
PROPANE					
COAL					
OTHER					
				A	B

ENERGY AND COST INDICES

Energy Utilization Index (A ÷ Gross Floor Area) _____ kBtu/ft^2/yr

Cost Index (B ÷ Gross Floor Area) _____ $/ft^2/yr

Total Water Use (C) _____ kGal/yr or _____ ft^3/yr _____ $/yr

Cost Index, Including Water (B + C) ÷ (Gross Floor Area) _____ $/ft^2/yr

ANALYSIS OF METERED ELECTRICAL DEMAND

Maximum Demand _____ kW or _____ kVA _____ (month)

Maximum Demand _____ kW × 1000 ÷ Gross Floor Area = _____ W/ft^2

Minimum Demand _____ kW or _____ kVA _____ (month)

Minimum Demand _____ kW × 1000 ÷ Gross Floor Area = _____ W/ft^2

COMPARISON WITH SIMILAR BUILDING(S)

	EUI kBtu/ft^2/yr	Annual Cost $/ft^2/yr	Max. Demand W/ft^2	Min. Demand W/ft^2
THIS BUILDING (ID# _____):	_____	_____	_____	_____
COMPARISON BUILDING/DATABASE[1]:	_____	_____	_____	_____

Discussion of comparative data:

_____
_____
_____
_____

Further analysis recommended? Y/N _____

Explain _____

_____

1. Source of Data: _____

CONVERSION MULTIPLIERS

(Thousands of Btu)
(Refer to ASHRAE Standard 105-1984 for unusual fuels)

Fuel	Measured Units	Conversion Multiplier
Electricity	kWh	3.413
	MWh	3413
Natural Gas	CCF	103
	MCF	1030
	Therm	100
	Cubic Meter	36.4
	Gigajoule	947.8
Purchased Steam	1000 Btu	1.0
	1000 lb	1000
	Therm	100
Purchased Hot Water	1000 Btu	1.0
Purchased Chilled Water	1000 Btu	1.0
	Ton-Hour	12.0
Oil #2	U.S. Gallon	139
	Imp. Gallon	167
	Liter	36.7
Oil #6	U.S. Gallon	154
	Imp. Gallon	185
	Liter	40.7
Propane	U.S. Gallon	91.6
	Imp. Gallon	110
	Liter	24.2
Anthracite Coal	Ton	25,400

WATER VOLUME CONVERSION

U.S. Gallons × 0.1337 = ft^3
Imperial Gallons × 0.1605 = ft^3

PRELIMINARY BUILDING USE [1]

Average Hours/Week _____ Average Weeks/Year _____

Average Number of Occupants During Normal Occupied Period _____

After Hours Cleaning (y/n) _____

OVERALL BUILDING SCHEDULE

Schedule during months of _____

Days	M	T	W	Th	F	Sat	Sun	Hol.
Hours Open								
Hours Closed								
Peak no. of occupants								
Avg. no. of occupants when open								

Schedule during months of _____

Days	M	T	W	Th	F	Sat	Sun	Hol.
Hours Open								
Hours Closed								
Peak no. of occupants								
Avg. no. of occupants when open								

1. Use for at least 51% of the conditioned space.

PRELIMINARY ENERGY ALLOCATION TO END USES

	Energy Type (from energy performance summary)	
End Use	**Primary**	**Secondary (more than 5% of end use)**
Heating	_____	_____
Cooling	_____	_____
Domestic Water Heating	_____	_____
Kitchen Cooking Equipment	_____	_____
Laundry Equipment	_____	_____
Other Processing Equipment	_____	_____

METERED CONSUMPTION MONTHLY DATA: _____(YEAR)

Utility Company _____ Account #_____ Rate Number_____
Energy Type _____ Consumption Units[1] _____
Electric Measured Demand Units[2] _____

METERING PERIOD DAY/MONTH/ YEAR					ELECTRICITY ONLY		COST[3]		
From	To	# of days	CONSUMPTION	"E" IF ESTIMATE	Measured Demand	Billed Demand	Consumption $	Demand $	Total $
Total									

1. CCF, therms, kWh, gal, etc.
2. kW, kVA, etc.
3. Costs should include taxes, fees, contract charges, etc.

DELIVERED CONSUMPTION MONTHLY DATA _____ (YEAR)

Utility Company_____ Account #_____ Rate Number_____

Energy Type _____ Consumption Units[1] _____

DELIVERY DATE	DELIVERY AMOUNT	TOTAL COST[2]
0	----------	----------
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
USE OF INVENTORY	C	D
TOTAL CONSUMPTION		

USE OF INVENTORY (C)

At Date 0 _____ (A)

365 Days After Date 0 _____ (B)

Use of Inventory (A-B) _____ (C)

VALUE OF INVENTORY USED

Latest Price _____ (D)

Value (C × D) _____

1. gal, lbs, etc.
2. Costs should include tax, fees, contract charges, etc.

Walk-Through Data

The information required in this section, can be obtained without conducting a detailed analysis of the building. A major goal of data collected in this section is to define the various space functions in the building. This information, in conjunction with specific information on the building itself, the HVAC system type(s), and the lighting system(s), will enable the analyst to commence a more detailed assessment of building energy performance.

It is intended that the information requested contribute to the establishment of a useful database of building functions and energy use. Therefore, the analyst is strongly urged to provide all possible information ***in the format provided.*** Shaded areas indicate information that is input into the database.

Space Function and System Summary

SPACE NUMBER[1]	A	B	C	D	E	F	UNACCOUNTED
FUNCTION TYPE[2]							
CONDITIONED AREA, ft^2							
SPACE USE[3]							
h/wk							
wks/yr							
PRINCIPAL LIGHTING TYPE							
PRINCIPAL TERMINAL HVAC TYPE							

Revisions to Original Building Functions

Discuss/describe revisions to the original functions of the building pertaining to current energy efficiency or longevity.

_____

_____

_____

Function Types

Auditorium
- 1 Auditorium

Corridor
- 2 Corridor

Classroom/Lecture Hall
- 3 Classroom/Lecture Hall

Electrical/Mechanical Equipment Room
- 4 General
- 5 Control Room

Food Service
- 6 Fast Food/Cafeteria
- 7 Leisure Dining
- 8 Bar/Lounge
- 9 Kitchen

Recreation/Lounge
- 10 Recreational/Lounge

Stair
- 11 Active Traffic
- 12 Emergency Exit

Toilet and Washroom
- 13 Toilet and Washroom

Garage
- 14 Auto and Pedestrian Circulation
- 15 Parking Area

Laboratory
- 16 Laboratory

Library
- 17 Audio Visual
- 18 Stack Area
- 19 Card Filing & Cataloging
- 20 Reading Area

Lobby (General)
- 21 Reception and Waiting
- 22 Elevator Lobbies

Atrium (Multi-Story)
- 23 First Three Floors
- 24 Each Additional Floor

Locker Room and Shower
- 25 Locker Room and Shower

Offices (Partitions > 4.5 ft below ceiling) open plan offices without partitions or with partitions more than 4.5 ft below the ceiling. Offices < 900 ft^2.
- 26 Reading, Typing and Filing
- 27 Drafting
- 28 Accounting

Offices (Partitions 3.5 - 4.5 ft below ceiling) Open plan offices > 900 ft^2 with partitions 3.5 to 4.5 ft below the ceiling.
- 29 Reading, Typing and Filing
- 30 Drafting
- 31 Accounting

1. Separate zones with at least 10% of conditioned space.
2. Major space function types.
3. See detailed usage schedule.

Offices (Partitions < 3.5 ft below ceiling) Enclosed offices > 900 ft^2 with partitions within 3.5 ft of the ceiling
- 32 Reading, Typing, and Filing
- 33 Drafting
- 34 Accounting

Common Activity Areas
- 35 Conference/Meeting Room
- 36 Computer/Office Equipment
- 37 Inactive Filing
- 38 Mail Room

Shop (Non-Industrial)
- 39 Machinery
- 40 Electrical/Electronic
- 41 Painting
- 42 Carpentry
- 43 Welding

Storage and Warehouse
- 44 Inactive Storage
- 45 Bulky Active Storage
- 46 Fine Active Storage
- 47 Material Handling

Unlisted Space
- 48 Unlisted Space

Airport, Bus, and Rail Station
- 49 Baggage Area
- 50 Concourse/Main Thruway
- 51 Ticket Counter
- 52 Waiting and Lounge Area

Bank
- 53 Customer Area
- 54 Banking Activity Area

Barber and Beauty Parlor
- 55 Barber and Beauty Parlor

Church, Synagogue, Chapel
- 56 Worship/Congregational
- 57 Preaching and Sermon/Choir

Dormitory
- 58 Bedroom
- 59 Bedroom with Study
- 60 Study Hall

Fire and Police Department
- 61 Fire Engine Room
- 62 Jail Cell

Hospital/Nursing Home
- 63 Corridor
- 64 Dental Suite/Exam/Treatment
- 65 Emergency
- 66 Laboratory
- 67 Lounge/Waiting Room
- 68 Medical Supplies
- 69 Nursery
- 70 Nurse Station
- 71 Occupational/Physical Therapy
- 72 Patient Room
- 73 Pharmacy
- 74 Radiology

Surgery and O.B. Suites
- 75 General Area
- 76 Operating Room
- 77 Recovery

Hotel/Conference Center
- 78 Banquet/Multipurpose Room
- 79 Bathroom/Powder Room
- 80 Guest Room
- 81 Public Area
- 82 Exhibition hall
- 83 Conference/Meeting
- 84 Lobby
- 85 Reception Desk

Laundry
- 86 Washing
- 87 Ironing and Sorting

Museum and Gallery
- 88 General Exhibition
- 89 Inspection/Restoration
- 90 Inactive Artifacts Storage
- 91 Active Artifacts Storage

Post Office
- 92 Lobby
- 93 Sorting and Mailing

Service Station/Auto Repair
- 94 Service Station

Theater
- 95 Performance Arts
- 96 Motion Picture
- 97 Lobby

Retail establishments (Merchandising and Circulation Area) applicable to all lighting, including accent and display lighting, installed in merchandising and circulation areas.

- 98 Type A (Mass Merchandising)
- 99 Type B (Service Retail)
- 100 Type C (Mixed Use Retail)
- 101 Type D (Specialty Shop)
- 102 Type E (Fine Merchandise)
- 103 Type F (Service Establishment)
- 104 Mall Concourse

Retail Support

- 105 Tailoring
- 106 Dressing/Fitting Rooms

All Sports

- 107 Seating Area

Badminton

- 108 Club
- 109 Tournament

Basketball/Volleyball

- 110 Intramural
- 111 College
- 112 Professional

Bowling

- 113 Approach Area
- 114 Lanes

Boxing/Wrestling (Platform)

- 115 Amateur
- 116 Professional

Gymnasium

- 117 General Exercise and Recreation

Handball/Racquetball/Squash

- 118 Club
- 119 Tournament

Ice Hockey

- 120 Amateur
- 121 College/Professional

Skating Rink

- 122 Recreational
- 123 Exhibition/Professional

Swimming

- 124 Recreational
- 125 Exhibition
- 126 Underwater

Tennis

- 127 Recreational (Class III)
- 128 Club/College (Class II)
- 129 Professional (Class I)

Table Tennis

- 130 Club
- 131 Tournament

HVAC Types

- 30 Single Zone
- 31 Multi Zone
- 32 Dual Duct
- 33 Variable Air Volume
- 34 Reheat
- 35 Fan Coil Units
- 36 Unit Ventilators
- 37 Packaged Terminal Air Conditioner
- 38 Steam/Hot Water Radiator/ Convector
- 39 Above system(s) w/Economizer

Lighting Types

- 1 Fluorescent
- 2 Incandescent
- 3 Mercury Vapor
- 4 Sodium
- 5 Metal Halide
- 6 Other

DETAILED USAGE SCHEDULE (OPTIONAL)

Usage Schedule for Each Major Space Type

Space Type _____

Schedule during months of _____

Days	M	T	W	Th	F	Sat	Sun	Hol.
Hours Open								
Hours Closed								
Peak no. of occupants								
Avg. no. of occupants when open								

Schedule during months of _____

Days	M	T	W	Th	F	Sat	Sun	Hol.
Hours Open								
Hours Closed								
Peak no. of occupants								
Avg. no. of occupants when open								

Building Shell Characteristics

Total exposed above-grade wall area (ft^2)	_____	Insulated? Y/N
Glazing area (% of exposed wall area)	_____	Single/Double?
Roof area (ft^2)	_____	Insulated? Y/N
Floor surface area exposed to outdoor conditions (ft^2)	_____	Insulated? Y/N
Above-grade wall area common with other conditioned building (ft^2)		

Operation and Maintenance

Discuss/describe operation and maintenance procedures pertaining to building energy efficiency.

_____
_____
_____
_____
_____
_____
_____

LIGHTING SYSTEMS DATA

Average installed load including ballast in more than 51%_____W/ft^2 of occupied space
Switches Accessible to more than 51% of occupants _____ Y/N?
Special Automatic Controls _____ Y/N?

Major Lighting Types 1 = Fluorescent 2 = Incandescent 3 = Mercury Vapor 4 = Sodium 5 = Metal Halide 6 = Other	% of Occupied Area

Heating, Ventilating, and Air-Conditioning System Data

Check all that apply in a significant way (affect > 5% of floor area or energy consumption)

Primary Cooling
- 10 Centrifugal Chiller [ ]
- 11 Reciprocating Chiller [ ]
- 12 Screw Chiller [ ]
- 13 Absorption Chiller [ ]
- 14 Package DX [ ]
- 15 Split DX [ ]
- 16 Air-Cooled Heat Rejection [ ]
- 17 Water-Cooled Heat Rejection [ ]

Primary Heating
- 20 Hot Water Boiler [ ]
- 21 Steam Boiler [ ]
- 22 Furnace [ ]
- 23 Ground-Source Heat Pump [ ]
- 24 Air-Source Heat Pump [ ]
- 25 Recirculating Water Source Heat Pump [ ]

AHU/Terminal Systems
- 30 Single Zone [ ]
- 31 Multi Zone [ ]
- 32 Dual Duct [ ]
- 33 Variable Air Volume [ ]
- 34 Reheat [ ]
- 35 Fan Coil Units [ ]
- 36 Unit Ventilators [ ]
- 37 Packaged Terminal Air Conditioners [ ]
- 38 Steam/Hot Water Radiators/Convectors [ ]
- 39 Above System(s) w/Economizer [ ]

Other
- 50 Cogeneration [ ]
- 51 Energy Monitoring and Control System [ ]
- 52 On-site Generation [ ]
- 53 Active Solar Equipment [ ]
- 54 Energy Recovery [ ]
- 55 Thermal Storage [ ]
- 56 Humidifiers/Dehumidifiers [ ]
- 57 Dessicant System [ ]
- 58 Evaporative Cooling [ ]
- 59 Other [ ]
  Define _____

Exhaust Systems
- 60 Fume Hoods, Constant Volume [ ]
- 61 Fume Hoods, VAV [ ]
- 62 Kitchen Hoods [ ]
- 63 Toilet [ ]
- 64 Locker [ ]
- 65 General [ ]

UNOCCUPIED SETBACK

(check all that apply)

Shutdown of:

AHUs by Time Schedule _____

Exhaust Fans by Time Schedule _____

Chillers:

By Time Schedule _____

By Outside Air Temperature _____

Boilers

By Time Schedule _____

By Outside Air Temperature _____

SPECIAL LOADS

Significant energy requirements not normally associated with this building type (for example, unconditioned parking garage lighting or ventilation, outdoor heated pool, snow melting, extensive outdoor lighting, process)

Describe	Peak Load		Avgerage Load		Operating	Period	Meter
	kW	kBtu/h	kW	kBtu/h	h/wk	wk/yr	Number

Building and Systems Report

The forms in this section are intended to provide general guidance in preparing a report on the analysis of the building and its systems. It is not uncommon for the final report to be disseminated to and used by people with a wide variety of interests, including finance, management, operation, maintenance, and engineering. Therefore, within practical constraints of time and budget, the analyst is encouraged to be as thorough and clear as possible in collecting and presenting the measured data and the descriptions thereof.

ENVELOPE CHARACTERISTICS

Building ID _____

Date of Audit Month _____ Year _____

Construction Code	R-Value	Glass Shading Coefficient	Area (ft^2)

(Include miniature building floor plan, showing orientation)

CONSTRUCTION TYPE CODES

Walls

W0 = Other _____
W1 = Wood
W2 = Masonry
W3 = Concrete, Above Grade
W4 = Concrete, Below Grade
W5 = Metal
W6 = Stone
W7 = Glass
W8 = Adjacent Building

Doors

D0 = Other _____
D1 = Solid Wood
D2 = Hollow Wood
D3 = Uninsulated Metal
D4 = Metal, Insulated Core
D5 = Glass (<85%)

Roofs

R0 = Other _____
R1 = Concrete Deck
R2 = Wood Deck
R3 = Metal Deck

Windows

Sash Type
G0 = Other _____
Fixed, Wood Sash:
G11 = Single Glaze G21 = Double Glaze
Operable, Wood Sash:
G12 = Single Glaze G22 = Double Glaze
Fixed, Metal Sash:
G13 = Single Glaze G23 = Double Glaze
Operable, Metal Sash:
G14 = Single Glaze G24 = Double Glaze

LIGHTING SYSTEM CHARACTERISTICS

Describe in detail, include typical ceiling plans. Utilize space function format.	
• Typical W/ft^2	• Operating schedules
• Design of controls	• Operating and maintenance problems
• Typical W/ft^2 installed, by type of light source	
• Light levels, footcandles, 3 feet above floor, without daylight	
• % of lamps not functioning	

HVAC System Characteristics

Describe in detail, including floor plans and sketches.	
• Fuel Source	• Control Description and Setting
• Fuel Conversion Equipment	• Operating Periods
• Distribution Method	• Space Temperature Setting and Setback
• Terminal Type	• Operating and Maintenance Problems
• Equipment Capacity	

Heating System

Cooling System

Exhaust System(s)

INVENTORY OF MAJOR HVAC EQUIPMENT

This table format is intended as a guide. The information collected on systems need not be restricted to the format or categories below.

Designation	Location	Model/ Type	Size	Capacity	Serves	Operating Hours/Year	Remarks

Domestic Hot Water System Characteristics

Describe in detail:	
• Fuel Source	• Distribution
• Storage	• Setpoints
• Hours Operated	• Hours Required
	• Circulating Pump

Domestic Hot Water System

_____

_____

_____

OTHER SYSTEM CHARACTERISTICS

Describe in detail, include schematics as needed. Include any operating and maintenance problems.

Laundry

Food Preparation

Conveying System (Elevators, etc.)

Other

Energy Analysis Summary and Recommendations

The forms in this section are intended to report the results of the calculations and recommendations of the analyst. The forms provide a breakdown of energy use and cost by system components as well as recommendations for modifications. System interaction must be properly accounted for when combining more than one modification. The economics of each modification may vary, depending upon the order in which they are accomplished.

ENERGY ANALYSIS SUMMARY

Building ID _____

Date of Audit Month _____ Year _____

		kBtu ft^2/yr	$/$ft^2$/yr	$/yr
Actual Use	A			
Target[1]	B			
"Technical" Potential Savings	C (A-B)			
Savings from Measures Recommended for Implementation (see attached)	D			
Remaining Technical Potential Savings to be Defined	E (C-D)			
Realistically Achievable Potential Savings still to be Defined	F			
Total Achievable Savings	(D+F)			

Cost of Next Stage in Analysis $ _____ (G)

Cost of Measures Recommended (D) $ _____ (H)

Cost to Implement Potential Savings Still to be Defined (F) $ _____ (± ___ %)(I)

Total Implementation Cost (G+H+I) $ _____

1. Source: _____

COMPONENTS OF ANNUAL ENERGY USE

	Electricity		Fuel	Other	Total	% of Total	Total	% of Total
	kWh	kBtu	kBtu	kBtu	kBtu	Use	Cost	Cost
Space Heating								
O.A. Heating								
Space Cooling								
O.A. Cooling								
Fans								
Pumps								
DHW Generator								
Lighting Within Conditioned Area								
Lighting Outside Conditioned Area								
Receptacles								
Kitchen								
Laundry								
Central Computer								
Conveyance								
Laboratory Equipment								
Other (describe)								
Unaccounted								
TOTAL						100%		100%

Recommended Energy Conservation Measures

Measure Description	Energy Type(s)	Units Saved	$/Year Saved	Implementation Cost	Extra Oper + Maint Cost	Simple Payback (Years)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
Total if all measures implemented						

Exhibit C6

Commercial Loan Application

PRELIMINARY LOAN APPLICATION

Call XXX-XXX-XXXX• Fax Completed and Signed Application to XXX-XXX-XXXX.

IMPORTANT INFORMATION: If you are applying for individual lease or for joint lease with another person (including a joint account or an account that you and another person will use) complete all sections providing information about each individual applicant, joint applicant or user. If you are applying to guarantee the obligations of a business, complete all sections providing information about yourself. **Persons providing information who are not Applicants, Guarantors, or Company Authorized Users should not sign this statement.**

BUSINESS INFORMATION

Legal Business Name	DBA Name	Tax Identification No.
Street Address (no P.O. Boxes)	Billing Address (no P.O. Boxes)	☐ Sole Proprietorship
City/County/State/ZIP		☐ Individuals applying jointly for business purpose lease
Equipment Location (if different from above): Street Address/City/County/State/ZIP		☐ General Partnership
Contact	Phone No. ( ) / Fax No. ( )	☐ Limited Partnership
Nature of Business / Time in Business / Time as Owner / No. of Employees / Gross Annual Revenue		☐ Corp. or Ltd. Liability Co. Date of Org.____ State of Org.____
Is your business sales tax exempt? If "YES" indicate tax exempt number: ☐ NO ☐ YES	E-Mail Address	☐ Other:____

GUARANTOR INFORMATION *(ALL 20% OR MORE OWNERS AND OTHER GUARANTORS)*

Principal/Partner/Officer	Title	% Ownership	Date of Birth	Social Security #	U.S. Citizen ☐ YES ☐ NO
Home Address	City	State	ZIP	Home Phone ( )	
Billing Address (if different)	City	State	ZIP	Phone ( )	
Principal/Partner/Officer	Title	% Ownership	Date of Birth	Social Security #	U.S. Citizen ☐ YES ☐ NO
Home Address	City	State	ZIP	Home Phone ( )	
Billing Address (if different)	City	State	ZIP	Phone ( )	

EQUIPMENT INFORMATION

Please indicate the equipment you are planning to acquire:

Equipment Supplier:	Estimated Total Equipment Costs: $
Structure: ☐ Nominal (e.g. $1) Purchase Option Lease ☐ Fair Market Value Purchase Option Lease ☐ Trac	TERM: ____ Months

BANK REFERENCE

Bank Reference Name	Account/Loan Officer	Phone No. ( )
Account type: ☐ Checking ☐ Savings ☐ Loan ☐ Line of Credit	Account No.	Current Balance $ / Average Balance (6 months) $

"You," the "Applicant" (both terms include the business entity as well as all of the individuals named above), certify to us that you are applying for credit for business reasons, and not for personal, family or household purposes. Applicant authorizes XXXXXXX to obtain information from others concerning Applicant's credit and trade standing, including Applicant's personal credit report, and other relevant information impacting this application, and if the Lease is approved, from time to time during the term of the Lease. In addition to the information requested on this application, may subsequently request additional information from Applicant. **IMPORTANT INFORMATION: Except as otherwise prohibited by law, you agree and consent that the affiliates in XXXXXXX (collectively "Lender") may share with each other all information about you that Lender has or may obtain for the purposes, among other things, of evaluating credit applications or offering you products or services that Lender believes may be of interest to you. Under the Fair Credit Reporting Act there is certain credit information that cannot be shared about you (unless you are a business) if you tell Lender by writing to Lender at: XXXXXXX. Please provide your name, address, social security number and account number(s).** As an authorized agent of the applicant company, you represent that you have reviewed this document and the information herein is true, correct and complete. A photo static copy of this authorization shall be as valid as the original. **Ohio Residents Only:** The Ohio laws against discrimination require that all creditors make credit equally available to all creditworthy customers, and that credit reporting agencies maintain separate credit histories on each individual upon request. The Ohio civil rights commission administers compliance with this law. **New York Residents Only:** A consumer report may be requested in conjunction with this application. Upon your request, you will be informed whether or not a consumer report was requested and if such report was requested, informed of the name and address of the consumer reporting agency that furnished the report. Subsequent consumer reports may be requested or utilized in connection with an update, renewal or extension of the credit for which this application is made. **Vermont Residents Only:** You authorize Lender to obtain credit reports about you now and in the future for all legitimate purposes associated with this application or the account including, but not limited to: (a) evaluating this application; and (b) renewing, reviewing, modifying, and taking collection action on the account. **Important Information About Procedures for Opening A New Account:** To help the government fight the funding of terrorism and money laundering activities, Federal law requires all financial institutions to obtain, verify, and record information that identifies each person who opens an account. What this means for you: When you open an account, we will ask for your name, address, date of birth, business documents, and other information that will allow us to identify you. We may also ask to see your driver's license or other identifying documents.

COMPANY AND GUARANTOR SIGNATURES *(SIGN BOTH PLACES BELOW)*

We/I certify that we/I have read and agree with applicable terms and conditions above.

Company Authorized Signature	Title	Date
Company Authorized Signature	Title	Date
Guarantor / Owner / Individual Signature	Guarantor / Owner / Individual Signature	

(Rev.11/09)

Exhibit C7/R8

Consent to Release Utility Data

Set the PACE St. Louis

Exhibit C7/R8

Utility Data Release Authorization

Utility Account Holders, by optionally signing below, are hereby authorizing the utility providers listed below to release billing history, utility consumption history, and other data associated with the listed account numbers. This data will be viewed by the City of St. Louis, Missouri, the Clean Energy Development Board, the St. Louis Development Corp., and their third party service providers (collectively, the "Program") for the purposes of technical and credit evaluation as pertaining to a potential loan being applied for by the listed Homeowner. By signing below, you are authorizing the Program to access data up to 2 years prior to the date on this form.

Further, if a loan is issued through Set the PACE St. Louis for energy efficiency upgrades on the property associated with the listed utility accounts, you are authorizing the Program to access the same data going forward for the full term of the loan. Accessing such data after a loan closes enables full circle feedback to the Assessment Provider, Installing Contractors, and Program Administrator to validate performance resultant of improvements financed through the Program.

Signature(s) of Authorized Utility Account Holders

Fuel Type #1:		**Name on Account:**	
Utility Provider:		**Phone Number:**	
Account Number:		**Signature:**	_____
Date:			
Fuel Type #2:		**Name on Account:**	
Utility Provider:		**Phone Number:**	
Account Number:		**Signature:**	_____
Date:			
Fuel Type #3:		**Name on Account:**	
Utility Provider:		**Phone Number:**	
Account Number:		**Signature:**	_____
Date:			

Exhibit C8/R9

Assessment Contract

Exhibit C8/R9

DRAFT CONTRACT / WORK VERSION TO MARKUP
Set the PACE St. Louis
ASSESSMENT CONTRACT

This Assessment Contract ("Contract") is made and entered into as of this _____ day of _____, by and between the Clean Energy Development Board, a Missouri political subdivision ("CEDB"), and _____ ("Owner").

RECITALS

A. CEDB has established the Set the PACE St. Louis Program ("STP" or "Program") pursuant to which CEDB may levy assessments against developed residential, commercial, and industrial properties located in the specific Region, with the consent of the owners of such properties, to finance the acquisition, construction, or installation of certain qualifying renewable energy systems and energy efficient improvements. The purpose and method of administering assessments under the Program are described in the Set the PACE St. Louis Program and Administrative Guidelines adopted by the CEDB and SLDC on _____, 20__, as it may be amended from time to time (the "Report").

B. The CEDB is authorized by the PACE statute H.B. 1692 (the "Act").

C. Owner has submitted to CEDB that certain STP Loan Application dated _____, 200__, a copy of which is attached hereto as Exhibit "A" and incorporated herein by this reference (the "Application"). The Application describes, among other things, the renewable energy system(s) and/or energy efficiency improvements which are to be financed under the Program, and to be constructed or installed on the property of Owner described in Exhibit "B" attached hereto and incorporated herein by this reference (the "Property"). CEDB has approved the Application as provided in the Report.

D. Owner wishes to participate in the Program by executing this Contract with CEDB and using monies advanced by CEDB hereunder to finance the acquisition, construction, or installation on the Property of renewable energy systems and/or energy efficiency improvements described in the Application ("Energy Improvements"). The Energy Improvements and their construction and/or installation are collectively referred to herein as the "Work."

NOW, THEREFORE, in consideration of the mutual covenants contained herein and other valuable consideration, the receipt and adequacy of which is hereby acknowledged, the parties agree as follows:

Section 1. Contract Documents; Term.

(a) This Contract, together with the Application and the documents and instruments attached to and referenced in this Contract and the Application, are collectively referred to herein as the "Contract Documents."

(b) The term of this Contract shall be until the Assessment described herein and all accrued interest thereon, together with any applicable penalties, costs, fees, and other charge have been paid in full.

Section 2. Loan Amount; Assessment; Incidental Expenses.

(a) Subject to the conditions set forth herein, CEDB agrees to advance monies to Owner in the amount of the actual cost of the Work (the "Loan Amount"), provided the Loan Amount shall not exceed _____ Dollars ($_____) (the "Maximum Loan Amount"). The STP Administrator shall determine the Loan Amount on the basis of the best available written evidence of the Work's actual cost and in the exercise of the STP Administrator's best judgment. The STP Administrator shall determine the Loan Amount before advancing monies to Owner hereunder and following the post-completion inspection of the Energy Improvements by STP Staff, as described in Section 4 below. In the event that the actual cost of the Work exceeds the Maximum Loan Amount, Owner shall be solely responsible for the payments of all costs of the Work which exceed the Maximum Loan Amount, and Owner agrees to in any event to complete the Work and to fund all costs associated with such completion which may exceed the Maximum Loan Amount.

(b) In consideration of the monies advanced by CEDB hereunder, Owner promises to pay, without offset or deduction, an assessment levied against the Property pursuant to this Contract, the Act and applicable law (the "Assessment") together with the interest thereon as described herein. Upon execution of this Contract, CEDB will execute and cause to be recorded a notice of assessment in the office of the County Recorder ("County Recorder") substantially in the form set forth in Exhibit "C" attached hereto and incorporated herein by this reference (the "Notice of Assessment").

(c) Upon recordation of the Notice of Assessment, the Assessment and each installment thereof and the interest and penalties thereon, shall constitute a lien upon the Property until paid. Initially, as reflected in the Notice of Assessment, upon recordation of the Notice of Assessment, the Assessment shall equal the Maximum Loan Amount. Following CEDB's advance of monies to Owner hereunder, the Assessment shall equal the Loan Amount.

(d) Interest shall accrue on the unpaid Assessment from the date CEDB disburses the Loan Amount to Owner at the simple interest rate of seven percent (7%) per annum and shall be payable in installments as set forth on Exhibit "D" attached hereto and incorporated herein by this reference. Interest shall be computed on the basis of three hundred sixty (360) days a year. If a court of competent jurisdiction determines the interest or other

charges provided for herein in connection with the Assessment or the Annual Administrative Assessment (described in paragraph (f) below) exceed the limits permitted by applicable law, then: (i) any such interest or charge shall be reduced by the amount necessary to reduce the interest or charge to the permitted limit; and (ii) any sums already collected which exceed permitted limits will be refunded by CEDB. The STP Administrator, in his discretion, may make the refund by making a direct payment to Owner or by crediting the refund amount against the next installment or installments of the Assessment (described in paragraph (e) below).

(e) Annual installments of the Assessment, together with the annual interest of the Assessment, shall be collected on the property tax bill pertaining to the Property. The annual portion of the assessment coming due in any year, together with the annual interest on the Assessment, shall be payable in the same manner and at the same time and in the same installments as the general taxes of the CEDB on real property. The amount of each Assessment installment and the interest on the unpaid Assessment that will be placed on the tax roll each year is set forth in Exhibit "D."

(f) In addition to the Assessment, until the Assessment and the interest thereon is paid in full, Owner promises to pay, without deduction or offset, an annual administrative assessment levied against the Property pursuant to this Contract, the Act and applicable law to pay costs incurred by CEDB resulting from the administration and collection of the Assessment and from the administration or registration of any associated bonds or other financing arrangement, as described in the Report, and from the administration of any reserve fund and other related funds (the "Annual Administrative Assessment"). The Annual Administrative Assessment shall not exceed fifty dollars ($50) per year. The STP Administrator shall annually determine the amount of the Annual Administrative Assessment, not to exceed the amount set forth in the preceding sentence. The Annual Administrative Assessment shall be collected in the same manner as the Assessment. The Annual Administrative Assessment shall become a lien upon the Property at the same time as the property tax becomes a lien each year on the Property.

(g) The execution of this Contract by the parties constitutes the confirmation of the Assessment and the Annual Administrative Assessment by the CEDB Council and the levy of the Assessment and the Annual Administrative Assessment against the Property without any further action required by the parties. Owner expressly consents to the levy of the Assessment and Annual Administrative Assessment on the Property and the recordation of the Notice of Assessment, all as described herein, in the Act and in applicable law.

(h) The lien of the Assessment shall be co-equal to and independent of the lien for general taxes, and, except as provided in Government Code section _____, not subject to extinguishment by the sale of the Property on

account of the nonpayment of any taxes, and is prior and superior to all liens, claims and encumbrances on or against the Property except (i) the lien for general taxes or ad valorem assessments in the nature of and collected as taxes levied by the State of Missouri or any county, special district or other local agency, (ii) the lien of any special assessment or assessments the lien date of which is prior in time to the lien date of the Assessment, (iii) easements constituting servitudes upon or burdens to the Property, (iv) water rights, the record title to which is held separately from the title to the Property, and (v) restrictions of record.

(i) Owner acknowledges that as cumulative remedy, if any installment of the Assessment, or any interest thereon, together with any penalties, costs, fees, and other charges accruing under applicable taxation provisions are not paid when due, the CEDB Council may order that the same be collected by an action brought in a court of competent jurisdiction to foreclose the lien of the Assessment to the extent permitted, and in the manner provided by, applicable law.

(j) Owner may prepay the Assessment, in whole or in part, at any time upon the payment of the amount, including an amount equal to $_____ or _____ percent (___%) of the amount of the Assessment to be prepaid, determined by the STP Administrator in accordance with the Report. Owner shall notify the STP Administrator in writing of Owner's determination to prepay the Assessment, in whole or in part, at least thirty (30) business days prior to the date Owner intends to prepay the Assessment.

(k) Owner expressly acknowledges that the construction and/or installation of the Energy Improvements on the Property confer a special benefit to the Property in an amount at least equal to the Assessment.

(l) Owner expressly waives the notice, protest and hearing procedures of any applicable law other than the Act with respect to the levy and collection of the Assessment and Annual Administrative Assessment.

Section 3. Use of Proceeds

Owner shall use the Loan Amount for the sole purpose of paying the reasonable costs and expenses of the Work on the Property, and in connection therewith Owner shall comply with all requirements set forth in the Contract Documents.

Section 4. Loan Disbursement Procedures

(a) Notwithstanding anything to the contrary contained herein, CEDB shall have no obligation to disburse the Loan Amount hereunder unless and until each of the following conditions is satisfied, or any such condition is expressly waived by the STP Administrator:

(i) The receipt by the STP Administrator of a written certification from Owner, and the contractor(s), if any, that performed the Work, stating the actual cost of the Work and that the Work is complete. Such certification shall be in form and substance acceptable to the STP Administrator.

(ii) An inspection of the Work by CEDB Staff, and a determination by the STP Administrator that the Work has been completed in full compliance with the requirements of the Contract Documents.

(iii) The receipt by the STP Administrator of such other documents and instruments as the STP Administrator may require, including but not limited to, if applicable, the sworn statements of contractor(s) and releases or waivers of lien, all in compliance with the requirements of applicable law.

(iv) Owner has, as appropriate, executed and delivered to the STP Administrator the Contract Documents and other such documents or instruments pertaining to the Loan Amount or the Work as the STP Administrator may require.

(v) As of the date of disbursement of the Loan Amount, the STP Administrator shall have determined that the representations of the Owner contained in the Contract Documents are true and correct, and no Default (as defined in Section 13 below) shall have occurred or be continuing.

(vi) No stop payment or mechanic's lien notice pertaining to the Work has been served upon CEDB and remains in effect as of the date of disbursement of the Loan Amount.

(vii) CEDB shall have received a title policy with regard to the monies advanced to Owner hereunder.

(viii) Owner will, within fifteen (15) business days of presentation by the STP Administrator, execute any and all documents or instruments required by the Contract Documents in connection with the disbursement of the Loan Amount.

(b) Upon satisfaction of waiver of the conditions described in paragraph (a) above, CEDB will disburse the Loan Amount to Owner, provided, CEDB shall not be under any obligation to disburse the Loan Amount until the first day of the month immediately following the month in which all of the foregoing conditions were satisfied or waived.

Section 5. Reports.

Owner agrees, upon request of the STP Administrator, to promptly deliver to the STP Administrator, or, if appropriate, cause its contractor(s) to promptly deliver to the STP Administrator, a written status report regarding the Work.

Section 6. Representations and Warranties of Owner.

Owner promises that each representation and warranty set forth below is true, accurate, and complete as of the date of this Contract, and the date of the disbursement of the Loan Amount. The disbursement of the Loan Amount shall be deemed to be a reaffirmation by Owner of each and every representation and warranty made by Owner in this Contract. If Owner is comprised of the trustees of a trust, the following representations shall also pertain to the trustor(s) of the trust.

(a) Formation; Authority. If Owner is anything other than a natural person, it has complied with all laws and regulations concerning its organization, existence and

the transaction of its business, and is in good standing in each state in which it conducts its business. Owner is the owner of the Property and is authorized to execute, deliver and perform its obligations under the Contract Documents, and all other documents and instruments delivered by Owner to CEDB in connection therewith. The Contract Documents have been duly executed and delivered by Owner and are valid and binding upon and enforceable against Owner in accordance with their terms, and no consent or approval of any third party, which has not been previously obtained by Owner, is required for Owner's execution thereof or the performance of its obligations contained therein.
(b) Compliance with Law. Neither Owner nor the Property is in violation of, and the terms and provisions of the Contract Documents do not conflict with, any regulation or ordinance, any order of any court or governmental entity, or any building restrictions or governmental requirements affecting Owner or the Property.
(c) No Violation. The terms and provisions of the Contract Documents, the execution and delivery of the Contract Documents by Owner, and the performance by Owner of its obligations contained therein, will not and do not conflict with or result in a breach of or a default under any of the terms or provisions of any other agreement, contract, covenant, or security instrument by which Owner or the Property is bound.
(d) Other Information. All reports, documents, instruments, information and forms of evidence that have been delivered to CEDB concerning the disbursement hereunder and the Loan Amount are accurate, correct, and sufficiently complete to give CEDB true and accurate knowledge of their subject matter.
(e) Lawsuits. There are no lawsuits, tax claims, actions, proceedings, investigations or other disputes pending or threatened against Owner or the Property which may impair Owner's ability to perform its obligations hereunder, or which may impair CEDB's ability to levy and collect the Assessment and the Annual Administrative Assessment.
(f) No Event of Default. There is no event that is, or with notice or lapse of time or both would be, a Default under this Contract.
(g) Accuracy of Declarations. The declarations of Owner contained in the Application are accurate, complete, and true.

Section 7. Owner's Covenants.
Owner promises to keep each of the following covenants:
(a) Completion of Work and Maintenance of Energy Improvements. Owner shall, or shall cause its contractor(s) to, promptly commence construction of the Work, and diligently continue such Work to completion, in good and workmanlike manner and in accordance with sound construction and installation practices. Owner shall maintain the Energy Improvements in good condition and repair.
(b) Compliance with Law and Agreements. In commencing and completing the Work, Owner shall comply with all existing and future laws, regulations, orders, building restrictions and requirements of, and all agreements with and commitments to, all governmental, judicial and legal authorities having

jurisdiction over the Property or the Work, and with all recorded instruments, agreements, covenants and restrictions affecting the Property.
(c) Permits, Licenses and Approvals. Owner shall properly obtain, comply with and keep in effect all permits, licenses and approvals which are required to be obtained from any governmental authority in order to commence and complete the Work. Owner, upon the request of the STP Administrator, shall promptly deliver copies of all such permits, licenses and approvals to the STP Administrator.
(d) Site Visits. Owner grants CEDB, its agents and representatives the right to enter and visit the Property at any reasonable time, after giving reasonable notice to Owner, for the purposes of observing the Work. CEDB will make reasonable efforts during any site visit to avoid interfering with Owner's use of the Property. Owner shall also allow CEDB to examine and copy records and other documents of Owner which relate to the Work. Any site visit, observation or examination by CEDB shall be solely for the purposes of protecting CEDB's rights under the Contract documents.
(e) Protection Against Lien Claims. Owner shall promptly pay or otherwise discharge any claims and liens for labor done and materials and services furnished to the Property in connection with the Work. Owner shall have the right to contest in good faith any claim or lien, provided that it does so diligently and without delay in completing the Work.
(f) Insurance. Owner shall provide, maintain and keep in force at all times until the Work is completed, builder's all risk property damage insurance on the Property, with a policy limit equal to the full replacement cost of the Work.
(g) Notices. Owner shall promptly notify CEDB in writing of any Default under this Contract, or any event which, with notice or lapse of time or both, would constitute a Default hereunder.

Section 8. Completion of the Work.
(a) Consent and Authorization. This Contract constitutes consent and authorization, pursuant to Section _____ of the Act, for Owner to purchase directly the related equipment and materials for the Energy Improvements and to contract directly for the construction and/or installation of the Energy Improvements on the Property.
(b) Date of completion of the Work. Subject to Section 13(f) below, Owner agrees to complete the Work on or before _____, 20___.

Section 9. Mechanic's Lien and Stop Notices.
In the event of the filing of a stop notice or the recording of a mechanic's lien pursuant to applicable law of the State of Missouri and relating to the Work, the STP Administrator may summarily refuse to disburse the Loan Amount, and in the event Owner fails to furnish the STP Administrator a bond causing such notice or lien to be released within ten (10) days of notice from the STP Administrator to do so, such failure shall, at the option of the CEDB, constitute a Default under the terms of this Contract. Owner shall promptly deliver to STP Administrator copies of all such notices or liens.

Section 10. Indemnification.
(a) Owner shall indemnify, defend, protect and hold harmless CEDB and all agents, employees, attorneys and representatives of CEDB (collectively, the "CEDB Parties"), from and against all losses, liabilities, claims, damages (including consequential damages), penalties, fines, forfeitures, costs and expenses (including all reasonable out-of-pocket litigation costs and reasonable attorneys' fees) and any demands of any nature whatsoever related directly or indirectly to, or arising out of or in connection with, (i) the Contract Documents, (ii) the disbursement of the Loan Amount, (iii) the Work, (iv) the Energy Improvements, (v) any breach or Default by Owner under the Contract Documents, (vi) the levy and collection of the Assessment [and the Annual Administrative Assessment], (vii) the imposition of the lien of the Assessment, and (viii) any other fact, circumstance or event related to CEDB's extension and disbursement of the Loan Amount to Owner or Owner's performance of its obligations under the Contract Documents (collectively, the "Liabilities"), regardless of whether such Liabilities shall accrue or are discovered before or after the disbursement of the Loan Amount.
(b) The indemnity obligations described in this Section 10 shall survive the disbursement of the Loan Amount, the payment of the Assessment in full, the transfer or sale of the Property by Owner, and the termination of this Contract.

Section 11. Waiver of Claims.
For and in consideration of CEDB's execution and delivery of this Contract, Owner, for itself and for its successors-in-interest to the Property and for anyone claiming by, through, or under Owner, hereby waives the right to recover from and fully and irrevocably releases the CEDB Parties from any and all claims, obligations, liabilities, causes of action, or damages, including attorneys' fees and court costs, that Owner may now have or hereafter acquire against any of the CEDB Parties and accruing from or related to (i) the Contract Documents, (ii) the disbursement of the Loan Amount, (iii) the levy and collection of the Assessment and the Annual Administrative Assessment, (iv) the imposition of the lien of the Assessment, (v) the issuance and sale of any bonds or other evidence of indebtedness, or other financial arrangements entered into by CEDB pursuant to the Program, (vi) the performance of the Work, (vii) the Energy Improvements, (viii) any damage to or diminution in value of the Property that may result from the Work, (ix) any personal injury or death that may result from the Work, (x) the selection of manufacturer(s), dealer(s), supplier(s), contractors(s) and/or installer(s), and their action or inaction with respect to the Work or the Energy Improvements, (xi) the merchantability and fitness for any particular purpose, use or application of the improvements, (xiii) the workmanship of any third parties, and (xiv) any other matter with respect to the Program. This release includes claims, obligations, liabilities, causes of action, and damages of which Owner is not presently aware or which Owner does not suspect to exist which, if known by Owner, would materially affect Owner's release of the CEDB Parties.

OWNER HEREBY ACKNOWLEDGES THAT IT HAS READ AND IS FAMILIAR WITH THE PROVISIONS OF MISSOURI CIVIL CODE SECTION ___ ("SECTION ____"), WHICH IS SET FORTH BELOW: "A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM OR HER MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR." BY INITIALING BELOW, OWNER HEREBY WAIVES THE PROVISIONS OF SECTION ____ SOLELY IN CONNECTION WITH THE MATTERS WHICH ARE THE SUBJECT OF THE FOREGOING WAIVERS AND RELEASES.
Owner's Initials

_____ _____

The waivers and releases by Owner contained in this Section 11 shall survive the disbursement of the Loan Amount, the payment of the Assessment in full, the transfer or sale of the Property by Owner, and the termination of this Contract.

Section 12. Further Assurances.
Owner shall execute any further documents or instruments consistent with the terms of this Contract, including documents and instruments in recordable form, as CEDB shall from time to time find necessary or appropriate to effectuate its purposes in entering into this Contract and disbursing the Loan Amount.

Section 13. Events of Default.
(a) Subject to the further provisions of this Section 13, the failure of any representation or warranty of Owner contained herein to be correct in all material respects, or the failure or delay by Owner to perform any of its obligations under the terms or provisions of the Contract Documents, other than with respect to the payment of the Assessment, shall constitute a nonmonetary default hereunder ("Default"). Owner must immediately commence to cure, correct or remedy such failure or delay and shall complete such cure, correction or remedy with reasonable diligence, but in any event, within the time set forth in Section 13(b) below.
(b) If a Default occurs, prior to exercising any remedies under the Contract Documents or the Act, CEDB shall give Owner notice of such Default. If the Default is reasonably capable of being cured within thirty (30) days, Owner shall have such period to effect a cure prior to the exercise of remedies by CEDB under the Contract Documents or the Act. If the Default is such that it is reasonably capable of being cured, but not within such thirty (30) day period, and Owner (i) initiates corrective action within such thirty (30) day period, and (ii) diligently, continually, and in good faith works to effect a cure as soon as possible, then Owner shall have such additional time as is reasonably necessary to cure the Default prior to exercise of any remedies by CEDB. However, in no event shall CEDB be precluded from exercising its remedies if its security becomes or is about to become materially jeopardized by any failure to cure a

Default, or if the Default is not cured within one hundred and twenty (120) days after the first notice of Default is given.
(c) Subject to the provisions of paragraph (b) above, if any Default occurs CEDB may exercise any or all rights and remedies available to it under applicable law, at equity, or as otherwise provided herein. Upon the election of CEDB, if there has been no disbursement of the Loan Amount, this Contract shall terminate and, except as otherwise expressly provided herein, the parties have no further obligations or rights hereunder.
(d) Subject to the provisions of Section 17 hereof, any and all costs and expenses incurred by CEDB in pursuing its remedies hereunder shall be additional indebtedness of Owner to CEDB hereunder.
(e) Except as otherwise expressly stated in this Contract or as otherwise provided by applicable law, the rights and remedies shall not preclude exercise by CEDB, at the same time or different times, of any other rights or remedies for the same Default or any other Default. No failure or delay by CEDB in asserting any of its rights and remedies as to any Default shall operate as a waiver of any Default or of any such rights or remedies, or deprive CEDB of its rights to institute and maintain any actions or proceedings which it may deem necessary to protect, assert or enforce any such rights or remedies.
(f) Performance of the covenants and conditions imposed upon Owner hereunder with respect to the commencement and completion of the Work shall be excused while and to the extent that, Owner is prevented from complying therewith by war, riots, strikes, lockouts, action of the elements, accidents, or acts of God beyond the reasonable control of Owner; provided, however, that such event is not caused by the fault, negligent or misconduct of Owner; and provided, further, as soon as the cause or event preventing compliance is removed or ceases to exist the obligations shall be restored to full force and effect and Owner shall immediately resume compliance therewith and performance thereof.
(g) Remedies with respect to the nonpayment of the Assessment or other amounts payable by Owner hereunder are governed by the provisions of Section 2 hereof.

Section 14. Compliance with Local, State and Federal Laws.
Owner shall perform the Work, or cause the Work to be performed, in conformity with all applicable laws, including all applicable federal, state and local occupation, safety and health laws, rules, regulations and standards. Owner agrees to indemnify, defend and hold the CEDB Parties harmless from and against any cost, expense, claim, charge or liability relating to or arising directly or indirectly from any breach or failure of Owner or its contractor(s) or agents to comply with such laws, rules or regulations. The indemnification obligations described in this Section 14 shall survive the disbursement of the Loan Amount, the payment of the Assessment in full, the discharge of the lien, and the termination of this Contract.

Section 15. Severability.

Each and every provision of this Contract is, and shall be construed to be, a separate and independent covenant and agreement. If any term or provision of this Contract or the application thereof shall to any extent be held to be invalid or unenforceable, the remainder of this Contract, or the application of such term or provision to circumstances other than those to which it is invalid or unenforceable, shall not be affected thereby, and each term and provision of this Contract shall be valid and shall be enforced to the extent permitted by law.

Section 16. Notices.
All notices and demands shall be given in writing by certified mail, postage prepaid, and return receipt requested, or by personal delivery (by recognized courier service or otherwise). Notices shall be considered given upon the earlier of (a) personal delivery or (b) two (2) business days following deposit in the United States mail, postage prepaid, certified or registered, return receipt requested. Notices shall be addressed as provided below for the respective party; provided that if any party gives notice in writing of a change of name or address, notices to such party thereafter be given as demanded in that notice:

Set the PACE St. Louis Program c/o SLDC
15023 RPC Blvd.
Meramec, MO 64300

Attention: [STP Administrator]
To Owner: _____
_____
_____

Attention: _____

Section 17. Attorney's Fees and Costs.
In the event that any action is instituted to enforce payment or performance under this Contract, the parties agree that the non-prevailing party shall be responsible for and shall pay all costs and all attorneys' fees incurred by the prevailing party in enforcing this Contract.

Section 18. No Waiver.
No disbursement of the Loan Amount based upon inadequate or incorrect information shall constitute a waiver of the right of CEDB to receive a refund thereof from Owner.

Section 19. Governing Law.
This Contract shall be governed by the laws of the State of Missouri. Any legal action brought under this Contract must be instituted in the Superior Court of Missouri, or in an appropriate municipal court in that County or in the United States District Court for Missouri.

Section 20. Amendment of Contract.

No modification, rescission, waiver, release or amendment of any provision of this Contract shall be made except by a written agreement executed by Owner and CEDB.

Section 21. CEDB May Assign; Role of CEDB.
CEDB, at its option, may (i) assign any or all of its rights and obligations under this Contract, and (ii) pledge and assign its right to receive the Assessment and the Annual Administrative Assessment, and any other payments due to CEDB hereunder, without obtaining consent from Owner.

Section 22. Owner Assignment Prohibited.
In no event shall Owner assign or transfer any portion of this Contract or Owner's rights or obligations under the Contract without the prior express written consent of CEDB, which consent may be granted or withheld in the sole and absolute discretion of the CEDB.

Section 23. Relationship of Owner and CEDB.
The relationship of Owner and CEDB pursuant to this Contract is that of debtor and creditor and shall not be or be construed to be a joint venture, equity venture, partnership, or other relationship.

Section 24. General.
Time is of the essence of this Contract and of each and every provision hereof. This Contract, together with the other Contract Documents, constitutes the entire agreement between the parties hereto, and there shall be no other agreement regarding the subject matter thereof unless signed in writing by the part to be charged. If there is more than one "Owner," the obligations hereunder of all Owners shall be joint and several.

Section 25. Counterparts.
This Contract may be executed in several counterparts, each of which shall be deemed an original, and all of such counterparts together shall constitute one and the same instrument.

Section 26. Special Termination.
Notwithstanding anything to the contrary contained herein, this Contract shall terminate and be of no further force or effect if Owner has submitted to the STP Administrator a notice of its decision to cancel this transaction on or prior to the date and time described in the Notice of Right to Cancel which was delivered to Owner upon its execution of this Contract.

Section 27. No Third Party Beneficiary Rights.
This Contract is entered into for the sole benefit of Owner and CEDB and, subject to the provisions of Sections 10, 11 and 21, no other parties are intended to be direct or incidental beneficiaries of this Contract and no third party shall have any right in, under or to this Contract.

IN WITNESS WHEREOF, Owner and CEDB have entered into this Contract as of the date and year first above written.

OWNER:

_____

_____

Date of Execution by Owner:

_____, 20__

CEDB:

Clean Energy Development Board, a political subdivision in the State of Missouri

By: _____

Name: _____

Title: _____

ATTEST:

_____

STATE OF MISSOURI } ss.
COUNTY OF _____ }

On _____, before me,
_____, a notary public, personally appeared
_____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacities (ies), and that by his/her/their signature(s) on the instrument the person(s) or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Missouri that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.
Signature _____
(This area for official notarial seal)

STATE OF MISSOURI } ss.
COUNTY OF _____ }

On _____, before me,
_____, a notary public, personally appeared
_____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacities(ies), and that by his/her/their signature(s) on the instrument the person(s) or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Missouri that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.
Signature _____
(This area for official notarial seal)

EXHIBIT "A"
[ATTACH COPY OF EXECUTED AND APPROVED APPLICATION]

EXHIBIT "B"
DESCRIPTION OF THE PROPERTY

EXHIBIT "C"
NOTICE OF ASSESSMENT
[to be provided]

EXHIBIT "D"
SCHEDULE OF ASSESSMENT INSTALLMENTS, INTEREST THEREON,
[AND THE
MAXIMUM ADMINISTRATIVE ASSESSMENT]
[to be provided]

Exhibit C9/R11

Database Description

Set the PACE St. Louis

Exhibit C9/R11

Database Information

Database content

While financial information will be maintained by the lending institution, per their internal lending data retention protocols, certain project information pertaining to specific participating properties that can be aggregated to track program performance will be collected and maintained by the program administrator. Some of this data will include specific property information, such as address and physical description, the prioritized improvements recommended by the auditor, the improvements actually implemented along with the estimated energy savings of those improvements. The administrator will also collect actual utility data when available to compare with estimates. This data could be used to calculate estimated emissions reductions on a property and overall program basis. On an aggregate basis, this data will be able to demonstrate the efficacy of the program.

The specific fields required to maintain such data would include standard property information, i.e. homeowner name, street address, structure type, square footage, etc. Fields specific to the project information would be derived from the scope of work information and audit data to be supplied. Additional data would be calculated or derived from this information for generating reports and aggregation purposes.

Software to be used for maintaining project database

While there are many "off the shelve" database applications that could potentially be utilized in a program such as this, this is relatively new approach to the market of energy efficiency. There have been some smaller vendors that have attempted to address software application needs for energy efficiency projects on an aggregate basis, these are mostly for energy auditors to manage workload and do not address the specific reporting needs of a program such as this. The most likely way to address all of the data management and reporting requirements of the program is to utilize a customizable SQL based relational database product that can generate reports that are tailored to the requirements of the PACE Board and can be maximized for the benefit of the program. By building on a customizable SQL based relational database, alterations can be made as the program develops to address any reporting and calculation needs that may be unforeseen at program inception.

While there would be some difference in the data generated, the basic database structure of program is applicable to both residential and commercial projects.

Exhibit R1/C1

Wireframe Marketing Plan/Webpage Format

[See Exhibit C1/R1 Above]

Exhibit R2

Homeowner Program Application

Set the PACE St. Louis

Preliminary Program Application

Residential Property

This short questionnaire is designed for the Program Administrator and Lending Institution to best assess the property's eligibility for participation in the Set the PACE St. Louis Program. Please answer as honestly and accurately as possible

Residential Property Information:

Name: _____ Property Address: _____

City of St. Louis? Y N

Zip code: _____ Number of years at this address: ___

Owner of the property? Y ☐ N ☐ (only a property owner is eligible for the Program, if you are renting, however, your landlord can apply).

Approximate square footage _____

Number of residents living at this address: _____

What fuel does the property use for heating? Gas ☐ Electric ☐ Other (specify): _____

What is the age of the furnace? _____

What is the average monthly utility bill? ___$_____

What type of structure is the property? Brick ☐ Frame ☐ Other (specify): _____

What type of roof is on this property? Shingle ☐ Tile ☐ Flat ☐ Other (specify): _____

Is there a basement? Yes ☐ Slab ☐ Crawl Space ☐

Is the property a single family residence? Yes ☐ Duplex ☐ Quadplex ☐ Other ☐ (specify) ___

(if the building is larger than a quadplex, you may need to fill out a commercial Set the PACE St. Louis program application).

Is there something specific that you would like to address through participating in the Set the PACE St. Louis program (such as a installing particular energy efficiency improvement,

preventing drafts, saving money, etc.): _____

_____

Financial Information:

The lending institution will do a preliminary credit approval based on self reported information prior to doing a full credit check of the applicant.

Gross monthly household income: $_____

Real estate taxes (annual): $_____

Home owners insurance (annual): $_____

Estimated monthly payment obligations: $_____

Contractor referral:

If you were referred to the program by an energy auditor or contractor please indicate below:

Contractor company name: _____.

Homeowner acknowledgement and contact information:

Please supply the following contact information and place a check in front of your preferred method of contact:

Telephone: ☐ mobile_____ ☐ home _____ ☐ work _____

☐ Email: _____

By signing below you acknowledge that the Set the PACE St. Louis program will contact you within 2 – 4 business days with the results of your preliminary evaluation for eligibility as a participant in the program. Any action taken on your part prior to preliminary approval for participation in the Program may not be financed by the Program.

Please note, whether the property is determined to be eligible for participation in the Program will depend on further information and credit verification.

Signed (property owner): _____

Print name: _____

Exhibit R3

Potential Residential Contractor List

Set the PACE St. Louis

Exhibit R3

Potential Participating Residential Contractor List

Auditors

Advantage Air, LLC
Anton's Air Conditioning & Heating
Butterfly Energy Works
Energy Equity Builders
Home Green Home, LLC
Indoor Comfort Team
Inman Heating and Cooling
Urban League of St. Louis
Vogel Sheet Metal & Heating, Inc.

Air Sealing and Insulation Contractors (Thermal Integrity)

Anton's Air Conditioning & Heating
Goley Insulation
Henges Interiors
Home Green Home, LLC
Indoor Comfort Team
Urban League of St. Louis
Window World of St. Louis

Heating, Ventilation and Air Conditioning Contractors

Advantage Air, LLC
Air Comfort Service, Inc.
Anton's Air Conditioning & Heating
Averill Heating & Air Conditioning
Design Aire, Inc.
Fahy's Heating & Cooling
Galmiche and Sons, Inc.
Greg Bauer Services
Home Green Home, LLC
Indoor Comfort Team
Inman Heating and Cooling
Kirkwood Heating & Air Conditioning Co.
Peter's Heating & A/C
Premier Heating and Cooling, Inc.
Scott-Lee Heating Co.

Set the PACE St. Louis

Vogel Sheet Metal & Heating, Inc.
Unique Heating & Cooling

Doors, Windows and Roofing Contractors

Advantage Air, LLC
Amazing Siding Corp. ofMO
Anton's Air Conditioning & Heating
Champion Windows
Energy Equity Builders
Energy View Windows
Goley Insulation
Home Green Home, LLC
Indoor Comfort Team
J & J Window Sales, Inc.
Penny Windows, Inc.
Window World of St. Louis

Exhibit R4

BPI Technical Specifications

Building Performance Institute, Inc.

BPI Standards

BPI-101

Home Energy Auditing Standard

Raising the Bar in Building Performance Contracting

August 3, 2010

Notice

BPI standards, bulletins and other technical publications are designed to serve the public interest through eliminating misunderstandings between manufacturers, service providers and purchasers, facilitating interchangeability and improvement of products and services, and assisting the purchaser in selecting and obtaining, with minimum delay, the proper product or service for his or her particular need.

Existence of such standards, bulletins and other technical publications shall not in any respect preclude any entity affiliated with BPI (or not) from manufacturing or selling products or services not conforming to such standards, bulletins or other technical publications, nor shall the existence of such standards, bulletins and other technical publications preclude their voluntary use by those unaffiliated with BPI, whether the standard is to be used either domestically or internationally.

Standards, bulletins and other technical publications are adopted by BPI in accordance with the American National Standards Institute (ANSI) patent policy. By such action, BPI does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the standard, bulletin or other technical publication.

This standard does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

Formulated under the cognizance of the BPI Standards Technical Committee.

Table of Contents

Introduction (Informative)

The Building Performance Institute, Inc. (BPI) publishes standards for the existing residential building retrofit industry. This *Home Energy Auditing Standard* is the basis for BPI's Energy Auditor Certification and provides guidelines for the energy-auditing profession. The goal of this standard is to direct the energy auditor to develop a comprehensive list of measures which lead to whole-building, science-based energy improvements to existing low-rise residential buildings (single-family and multifamily). In this standard, these buildings are called "homes." An energy audit is an evaluation of a home's existing energy profile and the potential to improve the home's energy performance and considers the policies and procedures of applicable residential energy programs.

This standard is not specific regarding energy conservation measures and criteria. The auditor's role may vary depending on the context in which the audit was conducted. The energy auditor may be an independent third party, a sales person working for a contractor or a weatherization inspector. This standard assumes energy auditors will also follow in good faith their company policy and also conform to the policies of any participating program sponsor or funding source, as applicable, concerning energy-savings estimates and cost-benefit analysis.

Program requirements (including conditions for incentives), laws or regulations, and applicable building codes or ordinances may take precedence over these standards in setting requirements for energy audits, work scopes and Energy Conservation Measures (ECMs). Consumers and third-party funding sources often require an accounting of ECM costs and savings, energy savings, demand savings, and/or emissions reductions. Additionally, regional climate, housing types and market conditions vary.

1. Scope

This standard practice defines the criteria for conducting a building-science-based evaluation of homes (residential low rise buildings) in terms of energy usage, durability and occupant health/safety and provides a comprehensive scope of work to improve the home. The scope of work shall include a cost-benefit analysis.

2. General Energy Audit Requirements

An energy audit shall fulfill the following requirements:

2.1 Include a report, which considers applicable energy programs, incentives, regulations, energy costs, fuel types and typical local energy-consumption levels.

2.2 Be based on building-science principles and include the use of appropriate equipment in diagnosing opportunities for improving energy efficiency and minimizing health and safety hazards.

2.3 Include a base load energy use analysis and advice to clients on reduction strategies.

2.4 Produce a work scope that recognizes best-practice installation procedures as well as recommends a comprehensive set of specific energy efficiency and health/safety measures warranted by the site-specific circumstances.

3. Health-and-Safety Related Requirements

The energy audit report shall communicate health and safety concerns related to energy systems and proposed retrofit work. The report shall include recommendations to maintain or improve existing levels of health and safety and mitigate identified hazards.

The energy audit shall:

3.1 Not endanger the occupants or the auditor.

3.2 Include an interview of the occupant(s) about their awareness of energy-related home hazards.

3.3 Include a test of all combustion appliances in accordance with Section 7 of this standard.

3.4 Evaluate ventilation requirements in accordance with Section 8 of this standard.

3.5 Identify signs of moisture problems in accordance with Section 9 of this standard.

The energy audit report shall:

3.6 Identify existing hazards and hazards that may develop when the measures are installed and specify preventative measures.

3.7 Inform customers about identified and potential fire, structural, health and safety hazards related to energy systems and retrofit work.

3.8 Specify in the recommendations that workers do not disturb known or suspected lead, asbestos, or mold, unless the workers are qualified and use appropriate containment, cleaning and/or abatement procedures.

3.9 Inform customers about potential radon risk. Recommend radon testing in accordance with EPA guidelines, unless a sufficient radon-mitigation system is already in place.

3.10 Specify in the work scope that identified electrical hazards, which may hinder planned ECMs, are mitigated.

3.11 Specify appropriate safe work practices in the work scope.

4. Disclosure and Ethics

The energy audit report shall provide clear and accurate information to customers about ECMs, and health-and-safety improvements.

The energy audit report shall:

4.1 Disclose any potential conflict of interest of the auditor.

4.2 Disclose any products and services that the auditor or his/her company provides in addition to energy auditing.

4.3 Communicate as accurately as possible about the cost-effectiveness and feasibility of the recommended ECMs, based on modeling, utility-bill history or typical usage and energy cost for similar homes in the area.

4.4 Communicate the relative importance of each recommended health-and-safety improvement.

4.5 Provide to the customer a list of one or more contractors (BPI-accredited or equivalent), who perform diagnostic testing and retrofit work as applicable based on the work scope. If there is a local energy-efficiency retrofit program, the energy auditor may provide the home owner with program contact information instead of individual contractors.

5. Cost-Benefit Analysis

5.1 The audit shall include a comprehensive package of ECMs, using one of the following three methods for cost-benefit analysis:

5.1.1 Computer analysis using software approved by the U.S. Department of Energy (DOE).

5.1.2 Computer analysis, using software that is accredited by BPI, for conducting an analysis of energy savings and developing an appropriate work scope.

5.1.3 A priority list developed using computer analysis of regional housing stock and current energy prices. The priority list shall specify both seasonal and baseload ECMs and identify the type of housing covered by the priority list.

5.2 When energy-consumption records are available, the audit shall include an analysis of energy consumption records (at least 12 months) to justify estimates of energy savings from the installed ECMs.

6. Work Scope

The energy audit shall include a work scope detailing proposed ECMs. This work scope shall be based on an evaluation of the whole house according to the requirements of this standard and the objectives of the customer. The work scope shall not be based primarily on a narrow product line, services of a contractor or convenience. The objective of the work scope is to optimize home performance cost-effectively, while maintaining or improving health and safety and satisfying customer objectives.

The energy audit shall include the following requirements:

6.1 Interview with customers to understand their priorities and goals for home improvements.

6.2 Prioritization of health-and-safety improvements according to their urgency and importance.

6.3 Prioritization of ECMs, building repairs and renovation according to cost-effectiveness, feasibility and customer objectives.

6.4 Pre-work and post-work verification (such as diagnostic testing) should include all measures identified as part of the audit.

7. Combustion Appliance Testing

The energy audit shall include inspection of combustion systems for common safety problems that may be related to ECMs. The energy audit report shall specify remediation of conditions as required and shall specify that post-retrofit combustion-appliance testing be conducted.

7.1 Identify and communicate emergency problems — such as a gas leak or a dangerous level of carbon monoxide — clearly and immediately to the customer, landlord, utility representative and/or the auditor's supervisor and suggest appropriate solutions.

7.2 Test for gas leakage at connections of natural gas and propane piping systems. The report shall specify repair for leaks and replacement for hazardous or damaged gas connectors.

7.3 Inspect for oil leakage in oil-fired heating and water-heating systems.

7.4 Inspect combustion venting systems for damage, leaks, disconnections and other safety hazards.

7.5 Include combustion-appliance-zone (CAZ) pressure tests, carbon monoxide (CO) tests and spillage tests on all combustion appliances venting into atmospheric chimneys, including fan-assisted gas appliances, as follows:

7.5.1 Monitor for ambient CO during combustion testing, and discontinue testing if ambient CO level exceeds 35 parts per million (ppm).

7.5.2 Measure baseline pressure in the CAZ *with reference to* (WRT) outdoors.

7.5.3 Activate exhaust fans, clothes dryer and air handler to maximize negative pressure in the CAZ, with the exception of whole-house fans designed for night cooling.

7.5.4 Open or close interior doors as needed to maximize negative pressure in the CAZ.

7.5.5 Measure the change in CAZ pressure WRT outdoors that is induced by exhaust fan, air handler and door position, as compared to the baseline pressure obtained in 7.5.2. If the change in pressure is more than 5 Pa in the negative direction, the audit report shall specify measures to mitigate that induced negative pressure in the CAZ.

7.5.6 Operate open-combustion appliances, beginning with the smallest input, and test for spillage at the draft diverter, barometric draft control or burner inlet (fan-assisted appliances). If a combustion appliance spills for longer than 1 minute, the audit report shall specify measures to mitigate spillage.

7.5.7 Test for CO in undiluted flue gases of combustion appliances. If CO in undiluted flue gases is more than 100 ppm as measured or 200 ppm air-free measurement, the audit report shall specify service to reduce CO to below these levels (unless CO measurement is within manufacturers' specifications).

7.6 Include a CO test on all sealed-combustion and power-vented appliances (without atmospheric chimneys).

7.7 When cost-effective and feasible, the audit report shall recommend replacing open-combustion equipment with high-efficiency, sealed-combustion equipment or power-vented equipment (or non-combustion equipment, such as a heat pump).

7.7.1 The audit report shall specify CO testing for newly installed sealed-combustion and power-vented appliances.

7.8 Test gas ovens for CO.

7.8.1 If ovens produce more than 200 ppm of CO (or 400 ppm air-free measurement) in undiluted flue gases tested in the oven vent, the audit report shall specify service or replacement.

7.8.2 The audit report shall specify that every kitchen be ventilated as required in Section 8.2.

The energy audit report shall:

7.9 Specify smoke alarms for homes, per local code as a minimum, that don't already have them installed.

7.10 Specify CO monitors/alarms in homes with combustion appliances or attached garages, one per floor level.

7.11 Specify final combustion testing at project completion to ensure compliance with the above standards.

8. Indoor Air Quality and Ventilation

8.1 The energy audit shall strive to maintain or improve indoor air quality. The energy audit report shall specify improvements to reduce pollution sources and to provide adequate ventilation as follows:

8.1.1 Identify sources of indoor air pollution for customers and recommend the removal of the pollutant or implementation of the proper control.

8.1.2 Document the flow rate of all exhaust fans and whether the exhaust fans and clothes dryers vent to outdoors.

8.1.3 With an attached garage, document that an effective air barrier exists or include sealing of air leaks between the garage and house. Also, the energy audit report shall include sealing of air handlers and ducts that are located in the garage.

8.1.4 Document mechanical ventilation requirements using the approach based on the ASHRAE 62.2 – 2007 Standard.

8.1.5 Specify whole-house mechanical ventilation for all homes based on the ASHRAE Standard 62.2 – 2007, Section 4, as follows:

8.1.5.1 Nominal fan size to continuously provide airflow in cubic feet per minute (CFM) is based on the number of bedrooms and the conditioned floor area of the home. The fan's CFM shall be determined by using either the formula or the table that follows. The formula for CFM fan flow is:

CFM = (0.01 x conditioned floor area) + (7.5 x (number of bedrooms + 1))

8.1.5.2 The table for CFM fan flow follows:

Table 1. Accepted Sizing for Continuous Ventilation Fans

	Number of Bedrooms				
Floor Area (sq ft)	**0-1**	**2–3**	**4–5**	**6–7**	**> 7**
< 1500	30	45	60	75	90
1501–3000	45	60	75	90	105
3001–4500	60	75	90	105	120
4501–6000	75	90	105	120	135
6001–7500	90	105	120	135	150
> 7500	105	120	135	150	165
From ASHRAE Standard 62.2-2007, Table 4.1.					

8.2 Specify local (spot) ventilation for kitchens and bathrooms according to ASHRAE Standard 62.2 – 2007, Section 5. Use one of the two following options for complying with the kitchen and bathroom ventilation requirements. Both bathroom and kitchen requirements may be met by dedicated exhaust fans and/or a central ventilation system.

8.2.1 The report shall specify that each bathroom receives a minimum of 50 CFM of intermittent exhaust (with appropriate controls) or 20 CFM of continuous exhaust. Also, specify that each kitchen receives a minimum of 100 CFM of intermittent exhaust or 5 air changes per hour (ACH) of continuous exhaust based on kitchen volume.

8.2.2 If existing ventilation equipment can't be used to fulfill 8.2.1, and new equipment isn't specified, then airflow from the whole-house ventilation system may be increased to compensate, according to ASHRAE 62.2 – 2007, Appendix C.

8.3 The following exceptions can reduce or eliminate the need to install a whole-house ventilation system.

8.3.1 Whole-house ventilation systems aren't required for homes without mechanical cooling in International Energy Conservation Code (IECC) Zones 1 and 2 or for homes that are conditioned for less than 876 hours per year. These exceptions all require that the local jurisdictional authority determines that windows are an acceptable method of ventilation (ASHRAE Standard 62.2 – 2007, Section 4.1).

8.3.2 An infiltration credit may be applied to reduce whole-house mechanical ventilation requirement. The credit may be determined using ASHRAE Standard 62.2-2007, Section 4.1.3, if the building enclosure has been tested with a blower door. Guidance on using this section of the ASHRAE 62.2-2007 Standard can be found in Annex C. When the infiltration credit is larger than the nominal fan size specified in 8.1.5, a whole-house mechanical ventilation system isn't required.

9. Moisture Control

The energy audit shall include an inspection of each home for moisture problems and specifications for prevention and remediation, as applicable to the proposed ECMs for the following.

Note: Excessive moisture contributes to mold, indoor air pollution, and building durability problems.

9.1 Evidence of exterior water intrusion, such as roof leaks, foundation leaks, and ground-water intrusion.

9.2 Evidence of all interior water sources, such as plumbing leaks.

9.3 Effects of water damage on buildings, such as mold, mildew, insect damage, efflorescence, and stains, including evidence of damage due to expansive soils.

9.4 Existing vapor retarders, flashing, gutters or other moisture-control strategies.

9.5 Measures specified in the work scope to prevent potential moisture problems or mitigate identified moisture problems, as applicable.

10. Building Enclosure Performance

The energy audit shall include an evaluation of the performance of the building enclosure and include recommendations for upgrades as appropriate according to Sections 5 and 6.

The audit report shall include:

10.1 The air-leakage rate of the building enclosure, as determined by a blower door test. Pre-work blower-door testing may be deferred and specified as part of the work scope.

10.1.1 When enclosure air sealing is specified, specify a blower-door test when work is completed or as part of the final inspection.

10.2 Air-sealing work should be done prior to the insulation work.

10.3 Estimation of R-values of opaque building materials.

10.3.1 Evaluation of insulation retrofits for feasibility and energy savings.

10.4 Estimation of U-factors and solar heat gain coefficients (SHGCs) of windows and doors.

10.4.1 Evaluation of the feasibility and energy savings for window treatments, including window replacements for improvements in thermal resistance and/or shading.

10.5 In homes with mechanical cooling systems, evaluation of the feasibility and energy savings of shading and solar-reflectance retrofits for the roof and/or wall.

11. Heating and Cooling (HVAC) Efficiency

The energy audit shall include an evaluation of the performance of the building mechanical systems and the report shall recommend upgrades as appropriate according to Sections 5 and 6 of this standard.

11.1 Evaluation of furnace performance and efficiency.

11.2 Evaluation of air-conditioning and heat-pump performance and efficiency.

11.3 Evaluation of duct performance, including filter effectiveness and duct sizing.

11.4 Evaluation of air duct systems that are partially or fully outside the conditioned space for air leakage and thermal insulation. The energy audit shall prescribe one or more of the following two duct-sealing requirements. Pre-work duct testing may be deferred and specified as part of the work scope.

11.4.1 Evaluation of duct systems that are no more than 25% outside conditioned space with a pressure-pan test to identify useful duct sealing opportunities. Conduct this evaluation with a blower door depressurizing the building enclosure to 50 Pa. If the pressure at any duct register is more than 3 Pa or the average of all registers is more than 1 Pa, duct-sealing opportunities are likely and further testing is recommended.

11.4.2 When ducts are more than 25% outside conditioned space, the energy audit shall include a duct-pressurization test to evaluate duct leakage as part of the energy audit or specify a duct pressurization test prior to beginning duct-sealing work.

11.5 When duct sealing is specified, specify a duct-pressurization test when work is completed or as part of the final inspection.

11.6 Evaluate duct location and R-value; evaluate feasibility and energy savings of retrofit duct insulation, as applicable.

11.7 Evaluation of evaporative-cooler maintenance, installation and performance, as applicable.

11.8 Evaluation of boiler performance and efficiency, as applicable.

11.9 Evaluation of steam-heating distribution performance, as applicable.

11.10 Evaluation of hot-water space-heating distribution performance, as applicable.

11.11 Evaluation of hot-water heater and hot-water distribution performance, as applicable.

11.12 Evaluation of the feasibility and energy savings of HVAC equipment replacement. Specify that replacement systems comply with Air Conditioning Contractors of America (ACCA) *5 QI HVAC Quality Installation Specification.*

11.13 For equipment that isn't specified for replacement, specify cleaning, tuning, adjustment, control upgrades and repair in the work scope.

12. Baseload Energy Efficiency

The energy audit shall include an evaluation of baseload energy uses and the report recommends upgrades as appropriate, according to Sections 5 and 6.

12.1 During the audit, the customer shall be advised about behavioral changes that reduce energy consumption including:

12.1.1 Plug loads and associated electricity costs.

12.1.2 Calculated baseload energy consumption with the following energy uses disaggregated from one another: baseload, water heating, space heating, cooling and other seasonal consumption, such as pool heaters and pumps.

12.1.3 Household baseload energy use, as compared with similar homes in the region.

12.1.4 Value of turning off lights, televisions and other loads when not in use.

12.2 The energy audit shall include an evaluation of:

12.2.1 Refrigerator and freezer performance.

12.2.2 Lighting efficiency and efficient alternatives.

12.2.3 Clothes-dryer vents [restrictions, lint build-up or indoor termination and for appropriate venting materials].

12.2.4 Pool and spa energy consumption and conservation strategies.

12.2.5 The efficiency of other major baseload energy users.

12.3 The energy audit report shall include a recommendation of appropriate replacements or alternatives to appliances.

Annex A
Normative
BPI Home Energy Audit Standard-Referenced Documents

Item	Date	Standard Section
ANSI/ACCA 5 QI-2007, HVAC Quality Installation Specification	2007	*11.12*
ANSI/ASTM E779-03, Standard Test Measure for Determining Air Leakage Rate by Fan Pressurization	2003	*Insert in 10.1*
ANSI Standard Z223.1-2002, Annex H, Recommended Procedure for Safety Inspection of an Existing Appliance Installation	2002	*Insert in 7.5*
ASHRAE Standard 62.2-2007. Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.	2007	*8.1.4. 8.1.5. 8.2. 8.3.1.8.3.2, A, A.1; Annex C*
ASHRAE Standard 136-1993 (RA 2006). A Method of Determining Air Change rates in Detached Dwellings.	2006	*Annex C*
ASHRAE Standard 119-1988 (RA 2004). Air Leakage Performance for Detached Single-Family Residential Buildings.	2004	*Annex C*
CGSB 149.10-M86 "Determination of the Airtightness of Building Envelopes by the Fan Depressurization Method"	1986	*Annex C*
EPA Guidelines for Radon Testing		*3.9*
International Energy Conservation Code	2006	*8.3.1, 10.3. (compare component R-values to those specified in IECC)*
National Fuel Gas Code or International Fuel Gas Code		*Insert in 7.2 (procedure for testing gas or propane leakage in piping systems)*

Documents can be ordered from the following:

ACCA: Air Conditioning Contractors of America
2800 Shirlington Road, Suite 300
Arlington, VA 22206
(703) 575-4477
www.acca.org

ASHRAE: American Society of Heating Refrigeration and Air-conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329
(404) 636-8400
www.ashrae.org

ASTM International: American Society for Testing and Materials
100 Barr Harbour Drive,
P.O. Box C700
West Conshohocken, PA 19428-2959
(610) 832-9585
www.atsm.org

CGSB: Canadian General Standards Board
6B1, Place du Portage, Phase III
11 Laurier Street
Gatineau, Québec
K1A 0S5
(819) 956-1586
www.pwgsc.gc.ca/cgsb

International Energy Conservation Code: International Code Council
500 New Jersey Avenue, NW, 6th Floor,
Washington, DC 20001
[P] 1-888-ICC-SAFE (422-7233)
www.iccsafe.org

ANSI Standards Z223.1-2002; National Fuel Gas Code: National Fire Protection Association
1 Batterymarch Park
Quincy, Massachusetts
USA 02169-7471
(617) 770-3000
www.nfpa.org

Annex B
Normative
Terms and Definitions

ACCA – Air Conditioning Contractors of America

ACH – Air changes per hour

ANSI – American National Standards Institute

ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers

BPI – Building Performance Institute, Inc.

CAZ – Combustion appliance zone

CFM – Cubic feet per minute

CO – Carbon monoxide

Home – See low-rise residential building, below

IECC – International Energy Conservation Code

EA – Energy auditing

ECM – Energy Conservation Measure

Low-rise Residential Building – a single family detached or attached building *or* a multifamily building less than four stories tall.

PV – Photovoltaic

SHGC – Solar heat gain coefficient

Annex C
(Informative)
Infiltration Credit Guidance

(From ASHRAE 62.2-2007, Section 4.1.3, used with permission)

C.1 Natural infiltration shall be calculated for existing buildings using either:

1. The normalized leakage calculated from measurements of envelope leakage using either ASTM E779-03 or CGSB 149.10-M86 *or*
2. The envelope air flow at 50 Pa (cfm50 or L/s@50).

C1.1 Normalized Leakage

C1.1.1 ASTM Procedure. To calculate the leakage area from the ASTM E779[2] standard, the leakage area for pressurization and depressurization (using a 4-Pa reference pressure) shall be averaged using Equation C1:

$$L = \frac{L_{press} + L_{depress}}{2} \quad \textbf{(C1)}$$

Where

L = leakage area (ft^2) (m^2)

L_{press} = leakage area from pressurization (ft^2) (m^2)

$L_{depress}$ = leakage area from depressurization (ft^2) (m^2)

C1.1.2 CGSB Procedure. To calculate the leakage area from CAN/CGSB-149.10-M86[3], the following modifications to the test procedure must be made: (1) all vents and intentional openings must be in the same configuration as specified in the ASTM standard (i.e., HVAC dampers and registers should be in the normal operating position; fireplace and other dampers should be closed unless they are required for test operation), (2) height and floor area must be reported consistently with the definitions of this standard, and (3) the leakage area as calculated from the CGSB procedure must be converted using Equation C2:

$$L = 0.61(0.4)^{n-0.5} L_{cgsb} \quad \textbf{(C2)}$$

Where

L = leakage area (ft^2) [m^2]

n = exponent measured from the CGSB standard

L_{cgsb} = CGSB leakage area, as modified above (ft^2) [m^2]

C1.1.3 Envelope air flow at 50 Pa. Leakage area shall be calculated using Equation C3.

$$L\left(ft^2\right)=\frac{cfm50}{1100} \quad \textbf{(C3-SI)}$$

$$L\left(m^2\right)=\frac{L/s@50}{5500} \quad \textbf{(C3-IP)}$$

A1.2 Normalized Leakage

Normalized leakage shall be calculated using Equation C3:

$$NL=1000\frac{L}{A}\left(\frac{H}{Ho}\right)^{0.3} \quad \textbf{(C3)}$$

Where:

NL = normalized leakage

Ho = height of a single story (8 ft) [2.5 m]

H = height of the building (ft) [m]

L = leakage area of the space (ft^2) [m^2]

A = floor area of the space (ft^2) [m^2]

A1.3 Natural Infiltration

The natural infiltration air flow rate shall be calculated using Equation C4.

$$Q_{nat}\left(cfm\right)=\frac{NLwV}{60} \quad \textbf{(C4-IP)}$$

Where w is the weather factor from Table C1 (from ASHRAE Std. 136), V is the volume of the house (ft^3).

$$Q_{nat}\left(L/s\right)=\frac{NLwV}{3.6} \quad \textbf{(C4-SI)}$$

Where w is the weather factor from Table C1 (from ASHRAE Std. 136), V is the volume of the house (m^3).

A1.4 Infiltration credit

The infiltration credit shall be calculated using Equation C5.

$$Q_{credit} = \frac{1}{2}\left(Q_{nat} - 0.02FA\right) \quad \textbf{(C5-IP)}$$

where FA is the floor area of the home (ft^2).

$$Q_{credit} = \frac{1}{2}\left(Q_{nat} - 0.1FA\right) \quad \textbf{(C5-SI)}$$

where FA is the floor area of the home (m^2).

1.5 Installed fan flow rate

The installed fan flow rate shall be calculated using Equation C6:

Q_{fan} = CFM(from 8.1.5)-Q_{credit} **(C6-IP)**

Q_{fan} = L/s(from 8.1.5)-Q_{credit} **(C6-SI)**

Table C1

Values of the Weather Factor W for Canadian and U.S. Locations

Note: Source indicates the source of the weather data.

WYEC[2] = weather year for energy calculations

TMY[3] = typical meteorological year

CAN[4] = average of the ten recent years of weather data

City, State, Prov.	w[ACH]	Source
Adak, AK	1.16	TMY
Annette, AK	0.94	TMY
Bethel, AK	1.21	TMY
Big Delta, AK	0.99	TMY
Fairbanks, AK	0.90	TMY
Gulkana, AK	0.95	TMY
Homer, AK	0.87	TMY
Juneau, AK	0.95	TMY
King Salmon, AK	1.09	TMY
Kodiak, AK	0.93	TMY
McGrath, AK	0.90	TMY
Summit, AK	1.12	TMY
Birmingham, AL	0.69	TMY
Mobile, AL	0.76	TMY
Calgary, AB	0.94	CAN
Edmonton, AB	0.88	CAN
Fort Smith, AR	0.76	TMY
Little Rock, AR	0.75	TMY
Phoenix, AZ	0.68	TMY
Prescott, AZ	0.81	TMY
Tucson, AZ	0.79	TMY
Winslow, AZ	0.82	TMY
Yuma, AZ	0.77	TMY
Castlegar, BC	0.71 0.93	CAN
Fort St. John, BC		CAN
Prince Rupert, BC	0.88	CAN
Vancouver, BC	0.78	WYEC
Victoria, BC	0.69	CAN
Williams Lake, BC	0.83	CAN
Arcata, CA	0.74	TMY
Bakersfield, CA	0.68	TMY
China Lake, CA	0.67	TMY
Dagget, CA	0.90	TMY
El Toro, CA	0.57	TMY
Fresno, CA	0.69	TMY
Long Beach, CA	0.64	TMY
Los Angeles, CA	0.66	TMY
Mount Shasta, CA	0.78	TMY
Point Mugu, CA	0.63	TMY
Red Bluff, CA	0.81	TMY
Sacramento, CA	0.75	TMY
San Diego, CA	0.67	TMY
San Francisco, CA	0.92	TMY
Santa Maria, CA	0.70	TMY
Sunnyvale, CA	0.63	TMY

City, State, Prov.	w[ACH]	Source
Colorado Springs,	0.98	TMY
CO Denver, CO	0.87	TMY
Eagle, CO	0.80	TMY
Grand Junction, CO	0.87	TMY
Pueblo, CO	0.85	TMY
Hartford, CT	0.86	TMY
Washington, DC	0.76	TMY
Wilmington, DE	0.84	TMY
Apalachicola, FL	0.63	TMY
Daytona, FL	0.73	TMY
Jacksonville, FL	0.77	TMY
Miami, FL	0.69	TMY
Orlando, FL	0.73	TMY
Tallahassee, FL	0.63	TMY
Tampa, FL	0.75	TMY
Augusta, GA	0.69	TMY
Atlanta, GA	0.75	TMY
Savannah, GA	0.75	TMY
Hilo, HI	0.60	TMY
Honolulu, HI	0.81	TMY
Lihue, HI	0.94	TMY
Burlington, IA	0.90	TMY
Des Moines, IA	0.93	TMY
Mason City, IA	1.01	TMY
Sioux City, IA	0.99	TMY
Boise, ID	0.87	TMY
Lewiston, ID	0.71	TMY
Pocatello, ID	0.95	TMY
Chicago, IL	0.93	TMY
Moline, IL	0.86	TMY
Springfield, IL	0.93	TMY
Evansville, IN	0.76	TMY
Fort Wayne, IN	0.92	TMY
Indianapolis, IN	0.86	TMY
South Bend, IN	0.89	TMY
Dodge City, KS	1.11	TMY
Goodland, KS	1.09	TMY
Topeka, KS	0.87	TMY
Lexington, KY	0.80	TMY

Table C1 (continued)

Values of the Weather Factor W for Canadian and U.S. Locations

City, State, Prov.	w[ACH]	Source
Baton Rouge, LA	0.70	TMY
Lake Charles, LA	0.72	TMY
New Orleans, LA	0.71	TMY
Shreveport, LA	0.77	TMY
Boston, MA	1.07	TMY
Churchill, MB	1.24	CAN
Thompson, MB	0.92	CAN
Baltimore, MD	0.82	TMY
Bangor, ME	0.75	TMY
Caribou, ME	1.00	TMY
Portland, ME	0.91	TMY
Alpena, MI	0.82	TMY
Detroit, MI	0.92	TMY
Flint, MI	0.90	TMY
Grand Rapids, MI	0.89	TMY
Sault Ste Marie, MI	0.95	TMY
Traverse City, MI	0.94	TMY
Duluth, MN	1.00	TMY
Internat'l Falls, MN	0.98	TMY
Minneapolis, MN	0.97	TMY
Rochester, MN	1.03	TMY
Kansas City, MO	0.85	WYEC
Springfield, MO	0.95	TMY
St. Louis, MO	0.87	TMY
Jackson, MS	0.68	TMY
Meridian, MS	0.62	TMY
Billings, MT	1.07	TMY
Cut Bank, MT	1.04	TMY
Dillon, MT	0.90	TMY
Glasgow, MT	1.02	TMY
Great Falls, MT	1.05	TMY
Helena, MT	0.89	TMY
Lewistown, MT	0.90	TMY
Missoula, MT	0.79	TMY
Saint John, NB	0.95	CAN
Asheville, NC	0.69	TMY
Cape Hatteras, NC	0.94	TMY
Charlotte, NC	0.74	TMY
Greensboro, NC	0.72	TMY
Raleigh, NC	0.72	WYEC
Bismarck, ND	0.99	TMY
Fargo, ND	1.10	TMY
Grand Island, NE	1.06	TMY
North Platte, NE	0.95	TMY
Omaha, NE	0.87	TMY
Scottsbluff, NE	0.99	TMY

City, State, Prov.	w[ACH]	Source
Stephenville, NF	1.03	CAN
Concord, NH	0.76	TMY
Lakehurst, NJ	0.70	TMY
Albuquerque, NM	0.80	TMY
Clayton, NM	1.06	TMY
Roswell, MN	0.86	TMY
Truth or Conseq, NM	0.79	TMY
Tucumcari, NM	0.87	TMY
Shearwater, NS	0.87	CAN
Baker Lake, NT	1.25	CAN
Fort Smith, NT	0.92	CAN
Inuvik, NT	1.01	CAN
Elko, NV	0.77	TMY
Ely, NV	0.98	TMY
Las Vegas, NV	0.81	TMY
Lovelock, NV	0.78	TMY
Reno, NV	0.75	TMY
Tonopah, NV	0.90	TMY
Winnemucca, NV	0.84	TMY
Yucca Falls, NV	0.77	TMY
Buffalo, NY	0.99	TMY
Massena, NY	0.90	TMY
New York Cen. Park, NY	0.98	TMY
New York LaGuar., NY	0.99	TMY
Rochester, NY	0.92	TMY
Syracuse, NY	0.88	TMY
Akron, OH	0.91	TMY
Cincinnati, OH	0.84	TMY
Cleveland, OH	0.96	WYEC
Columbus, OH	0.86	TMY
Dayton, OH	0.86	TMY
Toledo, OH	0.90	TMY
Youngstown, OH	0.92	TMY
Okalahoma City, OK	1.05	TMY
Tulsa, OK	0.93	TMY
Kapuskasing, ON	0.92	CAN
Sault Ste. Marie, ON	0.90	CAN
Thunder Bay, ON	0.86	CAN
Toronto, ON	0.82	WYEC
Windsor, ON	0.87	CAN
Astoria, OR	0.85 0.67	TMY
Medford, OR		TMY
North Bend, OR	0.90	TMY
Portland, OR	0.76	TMY
Redmond, OR	0.80	TMY
Salem, OR	0.80	TMY

Table C1 (continued)

Values of the Weather Factor W for Canadian and U.S. Locations

City, State, Prov.	w[ACH]	Source
Allentown, PA	0.80	TMY
Erie, PA	1.00	TMY
Harrisburg, PA	0.76	TMY
Philadelphia, PA	0.85	TMY
Pittsburgh, PA	0.85	TMY
Charlottetown, PE	1.04	CAN
Quebec, PQ	0.84	CAN
Schefferville, PQ	1.13	CAN
Sept Iles, PQ	0.96	CAN
Montreal, PQ	0.86	WYEC
Providence, RI	0.91	TMY
Charleston, SC	0.77	TMY
Columbia, SC	0.67	TMY
Greenville, SC	0.69	TMY
Huron, SD	1.09	TMY
Pierre, SD	1.00	TMY
Sioux Falls, SD	1.05	TMY
Regina, SK	1.05	CAN
Saskatoon, SK	0.98	CAN
Chattanooga, TN	0.64	TMY
Knoxville, TN	0.68	TMY
Memphis, TN	0.78	TMY
Nashville, TN	0.74	WYEC
Abilene, TX	1.05	TMY
Amarillo, TX	1.14	TMY
Austin, TX	0.80	TMY
Brownsville, TX	0.90	TMY
Corpus Christi, TX	0.86	TMY
El Paso, TX	0.76	TMY

City, State, Prov.	w[ACH]	Source
Fort Worth, TX	0.89	TMY
Houston, TX	0.81	TMY
Kingsville, TX	0.72	TMY
Laredo, TX	0.91	TMY
Lubbock, TX	1.00	TMY
Lufkin, TX	0.64	TMY
Midland Odessa, TX	0.96	TMY
Port Arthur, TX	0.79	TMY
San Angelo, TX	0.84	TMY
San Antonio, TX	0.83	TMY
Sherman, TX	0.80	TMY
Waco, TX	0.92	TMY
Wichita Falls, TX	0.99	TMY
Cedar City, UT	0.81	TMY
Salt Lake City, UT	0.87	TMY
Norfolk, VA	0.84	TMY
Richmond, VA	0.75	TMY
Roanoke, VA	0.74	TMY
Olympia, WA	0.77	TMY
Seattle, WA	0.85	TMY
Spokane, WA	0.85	TMY
Yakima, WA	0.81	TMY
Eau Claire, WI	0.93	TMY
Green Bay, WI	0.94	TMY
La Crosse, WI	0.86	TMY
Madison, WI	0.91	TMY
Milwaukee, WI	1.00	TMY
Charleston, WV	0.66	TMY
Casper, WY	1.15	TMY
Cheyenne, WY	1.08	TMY
Rock Springs, WY	0.98	TMY
Sheridan, WY	0.83	TMY
Whitehorse, YT	0.94	CAN

Exhibit R5

Loading Order of Improvements

City of St. Louis Residential PACE Program Outline

1) Eligibility: Fee simple owners of residential property in the City who have met the program's financial criteria.

Note: There is a limitation on availability for PACE financing for mortgaged residential properties due to concerns raised by the Federal Housing Finance Agency (FHFA). Currently, residential property owners who own their home free-and-clear or property owners with existing mortgages who either (a) agree to satisfy PACE assessment in full if they sell their home and/or (b) pursue PACE financing as a home equity loan (e.g., subordinate to existing mortgage) will be able to participate in the program.

2) Process: The property owner visits the Set the PACE St. Louis website portal to complete the following preliminary application:

- Identity and financial information for credit pre-screening. This information is provided to the bank for initial credit review within 48 hours. Owner pays a nominal non-refundable application fee for pre-screening.

- Information regarding the home (age, type, size, utility information, etc.)

- Information regarding their expectations
  - what they would like to accomplish
  - what improvements they are hoping to finance

- Information regarding how they learned about the program for purposes of referral of energy auditor and/or contractor.

Note: If applicant fails to satisfy the pre-screening process, no other fees beyond the nominal non-refundable application fee will be charged to applicant.

3) Contractor Referral: If the bank's pre-screening of the financial information indicates that the owner is eligible for the program, the owner is notified (via e-mail or other contact information provided through the website) and is provided with a list of program-approved energy auditors and/or contractors.

Notes:

- If the owner indicated in the preliminary application that he or she was referred to Set the PACE St. Louis by a program-approved energy

auditor and/or contractor, then the owner is not provided a list of approved energy auditors and contractors, but is instead directed back to the specific energy auditor and/or contractor that made the referral. This creates an incentive for the energy auditors and/or contractors participating in the program to market the program to prospective customers. An owner will be notified that he or she may request a list of energy auditors and/or contractors if so desired.

- The owner will be notified that final loan approval will occur after completion of the energy audit and review of the plans and costs of the recommended improvements. Set the PACE St. Louis will provide a disclaimer indicating that loan approval will depend upon final credit review.

- If the bank determines that an owner is not eligible for the program based upon the pre-screening of the financial information, the owner is provided with a list of options to explore outside Set the PACE St. Louis, including public weatherization programs, rebate programs and other energy efficiency financing options that may exist (private financing through contractors, utility companies, etc.). This referral will contain a disclaimer that Set the PACE St. Louis does not endorse any particular option and that the property owner should make his or her own decision and conduct any necessary due diligence as to whether any such options will meet his or her needs.

4) Energy Audit: The property owner contacts a program-approved energy auditor and/or contractor.

Note: An energy auditor may also serve as the home performance contractor for a project provided that specific approval has been received from the property owner. Any potential conflict of interest is sufficiently addressed by the presence of other consumer protections and safeguards designed into the program, including: pre-qualification of auditors and contractors, use of Building Performance Institute (BPI) protocol for energy audit, prioritization of improvements as described below, and quality assurance measures.

- Customer schedules energy audit. It is anticipated that the owner will be responsible for the subsidized cost of the energy audit—but the cost will be capped at $500. This outlay can be rolled into the loan or can be reimbursed to the owner at closing on the loan.

- Auditor performs energy audit to approved program standard using Building Performance Institute (BPI) certified building analyst on-site. Program audit standard should be based on BPI protocol without modeling requirements.

- Audit includes, at a minimum: blower door test, combustion safety test, thorough visual inspection of all accessible house areas including basement and attic, inspection of exterior and rooftop, evaluation of design efficiency of heating, ventilation and air conditioning (HVAC) systems.

- Auditor completes Set the PACE St. Louis standardized report detailing findings of energy audit.

- Auditor provides list of recommendations subject to program standards for improvement priority as follows:

  Priority 1 – DUCT SEALING: If house has ductwork that runs outside of the conditioned space (generally attic or crawlspace), then the first priority shall be to assure that the ductwork is tightly sealed (using program approved methods and materials) and then insulated to R-2 (plenum) and R-4 (runs).

  Then...

  Priority 2 – AIR SEALING: If blower door test indicates air infiltration that exceeds Building Air Standard (BAS) by more than 20%, then the second priority shall be to install air sealing measures to reduce air leakage by 20% or to BAS, whichever comes first.

  Then...

  Priority 3 – ATTIC INSULATION: If attic insulation is less then R-25 and/or if attic kneewall insulation is improperly installed, then the third priority shall be to install attic insulation a level of R-49 and to provide properly installed kneewall insulation (if applicable).

  Then...

  Priority 4 – BASEMENT SEALING AND INSULATION: If the house has a basement whose walls are not insulated above or below grade, then accessible rim joists and walls shall be insulated using spray foam (for rim joists) and a minimum R-11 wall insulation.

  Then...

  Priority 5 – FURNACE: If an existing gas furnace is less than 90% Annual Fuel Utilization Efficiency (AFUE) AND more than 10 years

old, then the furnace shall be replaced with a furnace of 92% AFUE or greater efficiency (if possible).

Ground Source or Air Source heat pumps may also be installed (required performance TBD).

Note: If the existing furnace is of 60% AFUE design, then the property owner may elect to replace the furnace as a 'second' priority with only duct sealing taking a higher priority.

Then...

Priority 6 – AIR CONDITIONING: If an existing air conditioner is rated at less than 10 Seasonal Energy Efficiency Ratio (SEER) AND more than 10 years old, then the air conditioner shall be replaced with a replacement air conditioner and coil that achieves Air Conditioning, Heating and Refrigeration Institute (AHRI) "Certified Product Performance" of 14 SEER or higher.

Then...

Other improvements may be installed, including:

- **White or green roofs**
- **Windows**
- **Doors**
- **Furnaces or Air conditioners whose performance does not call for priority replacement.**
- **Health, Safety, Durability.**
- **Renewable energy improvements**
- **Other**

5) Improvement Plan Approval: Auditor submits report and recommended improvement list to program administrator.

- With assistance from the program administrator, the property owner obtains prices and contracts from authorized program contractor(s) to make recommended improvements. Property owner may void contract if program approval is not received.
    - Some homes may be visited by program administrator for verification of recommended improvements.
        - List of improvements is approved based on information provided in report.

- Once the cost of the improvements is provided, the bank provides final loan approval and authorizes owner to complete improvements.

- Loan documents between the owner and the bank are completed based upon the bid from the contractor. Loan disbursement is subject to satisfactory completion of the improvements, to be verified before funding.

6) Improvements: Contractor follows program standards including...

- Blower door to be used to guide air sealing and to assure than result is not below BAS.

- Combustion safety testing is completed before contractor leaves house after air sealing is completed.

- HVAC sizing is accomplished using Air Conditioning Contractors of America (ACCA) Manual J.

- Efficiency is certified by AHRI.

7) After Improvements:

- Customer acknowledges completion by signed 'Certificate of Completion'

- Contractor submits completion certificate with other documents and invoice to program for payment.

- Once owner signs off on completion certificate, bank disburses loan proceeds and contractor is paid (and owner is reimbursed for costs outlaid for an energy audit if owner chose that option at the time of loan approval).

8) Quality Assurance:

- Program administrator contracts with independent party to conduct random quality assurance review by visiting homes to verify improvements:

  The goal will be to visit approximately 15% of all homes, although the quality assurance review may be tiered based upon the number of completed projects reported by each contractor. For example, the

independent contractor will conduct a quality assurance review of 100% of a contractor's first 3-5 completed jobs, 20% of that contractor's next 20 completed jobs and 5% of the contractor's completed jobs thereafter.

- Independent contractor compares audit report and recommended improvements to actual conditions found.
- Independent contractor compares improvements to authorized list and invoice.
- Independent contractor verifies accuracy of testing by repeating blower door and combustion safety testing.

8) Follow-Up:

- Program administrator measures overall program effectiveness by tracking utility usage.
- Program administrator receives permission from property owner for utilities to release historic usage data to program administrator (12 months).
- After 1, 2 and 3 years, program administrator obtains actual utility usage data and makes comparison to pre-improvement levels.

Exhibit R6

Scope of Work Document

Set the PACE St. Louis Program
Project Scope of Work Form

This form should be completed jointly between Homeowner and an authorized contractor(s). ***Do not begin any work until a Notice to Proceed has been emailed to the homeowner***. The Notice to Proceed will be issued once this form, the homeowner's loan, and general compliance issues have been reviewed and approved by the Program.

The electronic version of this form, as an Adobe PDF, can be completely filled out electronically, including e-signatures.

The form is set up to allow e-signatures by multiple parties if neccessary. Unapplicable sections can be ignored. There is no need to submit Page 1.

Note: At the completion of work, a Certification of Completion will need to be submitted to release loan closing documents and issue payment to the contractors.

Required Attachments

As applicable, attach or separately submit the following:

- A separate digital photograph of the full street facing side of the home, named with homeowner's last name in JPG format (minimum 3"x5") (no faxed photos accepted)

- Map showing location of the home with minimum of one closest intersection shown (Google or Mapquest required)

- AHRI certificates for proposed HVAC equipment [(HVAC contractor from Section D, below, should provide this for you) Only required for HVAC Projects]

Section A: Homeowner Data					
Last Name:			**First Name:**		
Email Address:			**Phone Number:**		
Project Street Address:					
City:		**State:**		**Zip Code:**	
Year House Constructed:		**# People Living Here:**			
Conditioned Square Feet:		**Conditioned Basement?**		[yes,no,n/a buttons]	
Co-Homeowner Data					
Last Name:			**First Name:**		
Email Address:			**Phone Number:**		
State Historic Preservation Office Review					
If project includes new windows or doors **and was built prior to 1967** the following digital .jpg photos are required: Photo of house to the left of the client ☐ Photo of house to the right of the client ☐ Photo of house across the street ☐ Photo looking up the street ☐ Photo looking down the street ☐					
The homeowner understands that State Historic Preservation Office review and approval is required **for all projects** and must attach or separately submit a digital photograph of the full street facing side of the home, named with homeowner's last name in JPG format (minimum 3"x5") (no faxed photos accepted), and a map showing location of the home with minimum of one closest intersection shown (Google or Mapquest preferred).					

Section B: Home Energy Assessment Data (Required as of 01/16/2012)

Price (for Test-In/Out/CAZ and Blower Door):			
Authorized Contractor:		Representative:	
Email Address:		Phone Number:	

Note: Homeowner and Assessment Provider must independently agree to price and payment terms prior to conducting assessment. This Scope of Work Form should be completed after completion of an assessment.

Test-In Data (prior to any improvements):
Date of Assessment must be no older than 12 months from date of this form in order to qualify.

Test Date:		Ambient CO (ppm):		Undiluted CO (ppm):	
Blower Door (CFM50):		Worst Case CAZ Depressurization (PA):			
Ventilation Required (CFM50):		CAZ Depressurization Limit (PA):		[pull down]	
Excess Air Leakage (CFM50):		CAZ Depressurization (Pass/Fail):		pass/fail	
Duct Leakage (@25PA):		Worst Case Spillage (Pass/Fail):		pass/fail	
Highest Press. Pan Reading (PA):		Worst Case Draft (Pass/Fail):		pass/fail	

Assessment Recommendations:

Computer Modeling Program (if used):	

Recommended Improvement Description - Including Health and Safety Matters	Est. Fuel Savings (kWh/yr or Therms/yr)	Est. Cost Savings ($/yr)	Est. Installation Costs ($)

Proposed Finance Summary - Home Energy Assessment

Price (Test-In/Out/CAZ & Blower Door):	$ 0
Less Homeowner Contribution/Commitment:	-$
Less Dealer/Contractor Incentives:	-$
Less Instant Utility Incentives or Rebates:	-$
Total Loan Amount to be Paid to Home Energy Assessment Contractor:	$

Certification of Accuracy: Contractor certifies the above data is accurate and real based on an assessment conducted in accordance with BPI standards. Savings estimates, if provided, are subject to weather, occupancy patterns and usage habits, and other variables beyond the control of the Assessment Provider and are not to be construed as guaranteed in any manner.

Authorized Signature: _____

Section C: Proposed Air/Duct Sealing and InsulationScope

Test-In Data must be provided in the Home Energy Assessment section above if air and/or duct sealing or insulation is selected as an improvement.

Authorized Contractor:		Representative:	
Email Address:		Phone Number:	
Sched./Est. Installation Date (allow 7 days for project and loan approval):			

Air Sealing	Description (material used and location)	Quantity (ft)	Price
Air Sealing:			
Air Sealing:			
Air Sealing:			
Air Sealing:			
Other:			
Overall Targeted Air Sealing Blower Door Results (CFM50):			

Duct Sealing	Description (material used and location)	Quantity (ft)	Price
Duct Sealing:			
Duct Sealing:			
Other:			
Overall Targeted Duct Leakage (@25PA):			

Insulation Improvements	Exist. (R)	Prop. (R)	Material	Quantity (ft)	Price
Attic Insulation:					
Wall Insulation:					
Crawl Space Insulation:					
Duct Insulation:					
Pipe Insulation					

Other Improvements	Description (material used and location)	Price
Duct Replacement:		
Attic Door Insulated Cover:		
Other (inc. Health/Safety):		

Proposed Finance Summary - Insulation and Air/Duct Sealing	
Sum of Proposed Insulation and Air/Duct Sealing Costs:	$ 0
Less Homeowner Contribution/Commitment:	-$
Less Dealer/Contractor Incentives:	-$
Less Instant Utility Incentives or Rebates:	-$
Total Loan Amount to be Paid to Insulation and Air/Duct Sealing Contractor:	$

Section D: Proposed HVAC and Water Heating Scope

For State Historic Preservation Office compliance reviews, proposed location of outside equipment must be described within 'Proposed Condition'

Authorized Contractor:		Representative:	
Email Address:		Phone Number:	
Sched./Est. Installation Date (allow 7 days for project and loan approval):			

Improvement	Description (Manufacturer, Model, Efficiency, Accessories)		Price
	Existing Condition (incl. age):		
	Proposed Condition:		
	Existing Condition (incl. age):		
	Proposed Condition:		
	Existing Condition (incl. age):		
	Proposed Condition:		
	Existing Condition (incl. age):		
	Proposed Condition:		

Check here to indicate that Manual J load calculations have been performed for all HVAC replacements	[checkbox]

Check here to indicate that AHRI certificates for proposed HVAC equipment have been provided to homeowner (must be attached, or submitted separately, for approval of this Scope of Work Form)	[checkbox]
Check here to indicate that exterior equipment will be in the same location as existing	[checkbox]

Duct Sealing	Description (material used and location)	Quantity (ft)	Price
Test-In Data must be provided in the Home Energy Assessment section above if duct sealing to existing ductwork is selected as an improvement.			
Duct Sealing:			
Duct Sealing:			
Overall Targeted Duct Leakage (@25PA):			

Insulation Improvements	Exist. (R)	Prop. (R)	Material	Quantity (ft)	Price
Duct Insulation:					
Pipe Insulation					

Other Improvements	Description (material used and location)	Price
Duct Replacement:		
Other (inc. Health/Safety):		

Proposed Finance Summary - HVAC and Water Heating	
Sum of Proposed HVAC and Water Heating Costs:	$0
Less Homeowner Contribution/Commitment:	-$
Less Dealer/Contractor Incentives:	-$
Less Instant Utility Incentives or Rebates:	-$
Total Loan Amount to be Paid to HVAC and Water Heating Contractor:	$

Section E: Proposed Doors, Windows and Roofing Scope

Note that for roofing scope, only the cost difference/premium between standard roof and ENERGY STAR roof is eligible for financing.

Authorized Contractor:		Representative:	
Email Address:		Phone Number:	
Sched./Est. Installation Date (allow 7 days for project and loan approval):			

Improvement		Description (Mfg, Model, Quantity, Size/Area, Performance	Price
	Existing Condition:		
	Proposed Condition:		
	Existing Condition:		
	Proposed Condition:		
	Existing Condition:		
	Proposed Condition:		

Proposed Finance Summary - Doors, Windows and Roofing

Sum of Proposed Doors, Windows and Roofing Costs:	$0
Less Homeowner Contribution/Commitment:	-$
Less Dealer/Contractor Incentives:	-$
Less Instant Utility Incentives or Rebates:	-$
Total Loan Amount to be Paid to Doors, Windows and Roofing Contractor:	$

Section F: Health & Safety/Other Improvements or Exception Requests

For improvements not explicitly allowed in the Eligible Improvements List, a rationale for the improvement (and/or exception request) must be described within 'Proposed Condition'

Authorized Contractor:		Representative:	
Email Address:		Phone Number:	
Sched./Est. Installation Date (allow 7 days for project and loan approval):			

Improvement		Description	Price
	Existing Condition:		
	Proposed Condition:		
	Existing Condition:		
	Proposed Condition:		
	Existing Condition:		
	Proposed Condition:		

Proposed Finance Summary - Health & Safety/Other Improvements

Sum of Proposed Health & Safety/Other Improvements Costs:	$0
Less Homeowner Contribution/Commitment:	-$
Less Dealer/Contractor Incentives:	-$
Less Instant Utility Incentives or Rebates:	-$
Total Loan Amount to be Paid to Health & Safety/Other Improvements Contractor Listed in this Section:	$

Section G: Proposed Total Project Finance Summary	
Loan Amount to be Paid to Home Energy Assessment Contractor:	$0
Loan Amount to be Paid to Insulation and Air/Duct Sealing Contractor:	$0
Loan Amount to be Paid to HVAC and Water Heating Contractor:	$0
Loan Amount to be Paid to Doors, Windows and Roofing Contractor:	$0
Loan Amount to be Paid to Health & Safety/Other Improvements Contractor Listed in that Section:	$0
TOTAL LOAN-FUNDED PROJECT COST (3% program fee will be automatically added to final loan amount):	$0
Desired Loan Term (3-10 years)	
Notes:	

Section H: Homeowner Certification

Homeowner has submitted a loan application through the online portal found under "Get Started" at www.StLouisCountySAVES.com and is aware of the time limit associated with it (90 days from date of approval) and will arrange to have all work completed and submit a Certification of Completion Form prior to that time.	[ ]
Date of Submission of Online Loan Application:	
Homeowner hereby acknowledges and understands that Set the PACE St. Louis does not endorse any particular contractor, but maintains a directory of contractors that have applied and been authorized to participate in the program. While the contractors in the directory have met certain requirements for participation, Homeowner will be entering into a direct relationship with the contractor of their choice and it is important to review credentials, qualifications, and references to make an informed decision. Please also note that the Program does not warrant any of the work performed and that the Homeowner is responsible for working directly with the selected contractor(s) to ensure that all work is performed to the Homeowner's satisfaction.	[ ]
Indicate if the undersigned is a family member and/or employee of any of the contractors that will be providing work on your home (this is an allowable arrangement but must be disclosed for quality assurance purposes).	[yes/no]

Homeowner Signature:	_____
Co-Homeowner Signature:	_____
Date:	

Section I: Program Certification

This sheet should be filled out and signed by either the homeowner or a 'Lead Contractor', if one is willing to serve in that role (ie, general contractor).

	Initial Below
The undersigned certifies that all quotes prepared and represented on this Project Scope of Work Form have been submitted by Set the PACE St. Louis authorized contractor(s).	[ ]
The undersigned acknowledges, understands and commits to adhere to all Program guidelines set forth in the Contractor Guide and on the Set the PACE St. Louis website.	[ ]
The undersigned is aware of the time limit associated with the online loan application (90 days from date of loan approval) and will work with homeowner to arrange to have all work completed and help the homeowner submit a Certification of Completion Form prior to that time.	[ ]

Authorized Signature:	_____		
Name:			
Date:			
If authorized signature above is the Prime (Lead/General) Contractor, provide the following:			
Company Name:			
Email Address:		**Phone Number:**	

Exhibit R7

Loan Application and Agreement

Exhibit R8/C7

Consent to Release Utility Data

[See Exhibit C7/R8 Above]

Exhibit R9/C8

Assessment Contract

[See Exhibit C8/R9 Above]

Exhibit R10

Residential QA Protocol

Set the PACE St. Louis

EXHIBIT R10

Quality Assurance Protocol

Program staff will perform quality assurance inspections on a tiered percentage of all reported projects:

QA Tier	Project Number	Inspection Rate
Tier One	First 3 – 5 jobs	100%
Tier Two	4 of the next 20 jobs	20%
Tier Three	All following jobs	5%

Contractors will progress through the tier system as they successfully demonstrate work has been completed as reported according to HEP Materials and Installation standards and BPI standards.

QA inspectors will evaluate work with relation to the Materials and Installation standards provided to you upon signing on as a program ally (attached). Of particular interest will be exhaust fan venting (bath fans) and moisture mitigation. We ask that you take the time to review the M and I standards and BPI standards with your staff to ensure that you are closely following required procedures. Improper installations may call for rework at the expense of the ally.

The QA process will be random. However, QA inspectors can be available to meet you at job sites for your installations and / or test out processes. Please engage them as they look forward to working with you.

Exhibit R11/C9

Database Description

[See Exhibit C9/R11 Above]